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ABSTRACT

This document resulted from a project undertaken to develop a set of program-specific and occupationally relevant performance (learning) objectives for the Ontario Basic Skills/Formation de Base de l'Ontario (OBS/FBO) program. It describes project activities, including a literature review in three related areas: understanding what literacy means, occupational literacy research findings, and basic skills for the workplace. Two project stages are discussed. The first is a survey in English and French of 325 Ontario (Canada) employers in 9 industrial sectors. The survey identified the core basic skills required at three entry levels to employment. The second stage is the consolidation of the survey findings into preliminary performance objectives for each of the six subject areas in OBS/FBO: communications, numeracy, science, computer literacy, work adjustment, and technical hands-on. The terminal performance objectives are presented in the body of the report. Appendixes, amounting to over one-half of the report, include the following: lists of employers surveyed; survey results; provincial, regional, and sectoral results; occupational sector job positions; onsite points of observation; OBS terminal and enabling objectives; and FBO terminal and enabling objectives. (YLB)

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ED 382 869

OCCUPATIONAL LITERACY

A Training Profile Development Project
For
Ontario Basic Skills/
Formation de base de l'Ontario

Ontario Ministry of Skills Development
Literacy Branch
1989

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LITERACY BRANCH
Community and Workplace
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ONTARIO MINISTRY OF SKILLS
DEVELOPMENT

Occupational Literacy:
A Training Profile Development Project for
Ontario Basic Skills/Formation de base de l'Ontario

ABSTRACT

The OBS/FBO Training Profile Development Project was undertaken to develop a set of program-specific and occupationally-relevant performance (learning) objectives for the OBS/FBO program. The project was a collaborative effort of the Ontario Ministry of Skills Development and the Ontario Colleges of Applied Arts and Technology.

There were two stages to the project. The first was a survey in English and French of 325 Ontario employers in 9 industrial sectors. The survey identified the core basic skills required at three entry levels to employment. The second stage was the consolidation of the survey findings into preliminary performance objectives for each of the six subject areas in OBS/FBO.

Once refined, these objectives will serve as the building blocks for development of models of integrated delivery. Instruction would then be able to reflect the reality of the workplace where performance requires the application of combinations of skills.

This Report is divided into three colour-coded sections:

i)	*White:*	*Description of the Project.* *Includes a review of the recent literature on occupational literacy, and sets out the research findings and the process of developing the performance objectives.*
ii)	*Yellow:*	*Research* *Includes the employer survey questionnaire results and charts of the data analyses by sector, region and province.* *(See reverse side of Abstract for summary of findings)*
iii)	*Green:*	*Basic Skills Training Profile (English and French)* *An inventory of learning objectives for the six subject areas, at three levels of achievement, of the OBS/FBO program. The learning objectives reflect the skills identified by the employer survey.*

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FINDINGS OF THE EMPLOYER SURVEY (1988)

Communications

For all occupational sectors - semiskilled, skilled and paraprofessional - employees require high levels of listening and speaking skills. Semiskilled employees read notes, letters and memos, interpret schedules, charts, tables, policy manuals, regulations and instructions and work, job or purchase orders. In addition to these reading competencies, the skilled and paraprofessionals must read technical reports, vouchers and claims. All three occupational levels require the ability to prepare short notes in the work setting. However, this is the only form of writing required for semiskilled positions. The skilled and paraprofessionals must be able to prepare a wider variety of writing formats, particularly memos, letters, estimates and reports.

Numeracy

Semiskilled positions in Ontario require a limited set of numeracy skills. These include performing calculations using whole numbers, fractions, decimals and percentages, recognizing common shapes and angles, estimating and measuring distance, area, weight and volume using metric and imperial measurements. The skilled and paraprofessionals must be able to make calculations with whole numbers using algebra at a one variable level. In some industrial sectors - mainly manufacturing, natural resources and construction - some paraprofessionals require skills in basic geometry, trigonometry and algebra at the two variable level.

Science

No science content is required for individuals in semiskilled positions. The skilled and paraprofessionals require a very limited background in general science, chemistry and physics. However, science content is more important for particular sectors, mainly health care, manufacturing, natural resources and construction.

Computer Literacy

Computer literacy is advantageous or essential for individuals functioning at the skilled and paraprofessional level but not for the semiskilled.

Work Adjustment

Work adjustment skills are critical to all three occupational levels, particularly interpersonal skills, job related attitudes and behaviours and safety related issues.

Technical Hands-On

Technical hands-on skills are most applicable to the semiskilled and skilled occupational levels with the skilled level requiring the greatest diversity.

INTRODUCTION

This report describes the development of proposed learning objectives for an occupational literacy program. Known as the Ontario Basic Skills/Formation de base de l'Ontario (OBS/FBO), the program was introduced by the Ontario Ministry of Skills Development in the fall of 1986 as part of the Ontario Training Strategy, a comprehensive package of programs designed to strengthen the Province's economic performance.

The OBS/FBO program is delivered by the Ontario Colleges of Applied Arts and Technology. Though the role of the program was clear from its inception, it was understood that its specific character and learning objectives would need to evolve as time and resources permitted. Accordingly, the Ministry of Skills Development funded this project, initiated in December, 1987.

The product was a collaborative effort of the Ministry of Skills Development and the front line program delivery people in the colleges. Ministry staff were guided by the belief that by involving the instructors, counsellors and others in direct contact with the learners, we would carve a more effective product and a stronger program. Those who participated in the project came away with a sense of excitement and promise about the product.

A central conclusion emerging from this project was that any curriculum based on the profile should integrate learning objectives and activities to reflect the way that tasks are performed in the workplace. In order to do this, a second stage in the project was proposed prior to any implementation by the colleges. This second stage will pilot the integration of objectives, learning activities and related learning materials as a model for future curriculum development by the colleges. It will be initiated in the Fall of 1989 and will be undertaken in partnership with the colleges in the 1989/90 academic year.

Although originally intended only for the OBS/FBO program, the eventual product of this project may well have application for other employment-related basic skills programs. At the least, the research underpinning is sufficiently generic as to be useful to a broader constituency.

Three individuals are singled out for their commitment and dedication to the task: Mr. Rick Embree of Humber College who wore many hats, including project manager, principal facilitator and writer of the chapters dealing with the analyses of the occupational survey; Dr. Maurice Taylor of Algonquin College who served as the principal designer of both the survey instrument and the data analysis process, and wrote the Review of the Literature; and Lynn Wallace of Cambrian College who assisted both in the survey development and in damage control whenever required. While these were the principal players, many of the individual college participants and project support staff made Herculean efforts to meet the short time lines and their commitment is gratefully acknowledged. A complete list of the participants from the colleges of applied arts and technology is contained in Appendix 13.

Barbara Shields
Project Coordinator
Literacy Branch

August, 1989

TABLE OF CONTENTS

Page

1. Review of the Literature 1-19

2. Overview of the Training Profile Development Project

2.1 Background 21-22
2.2 Conceptual Framework 23-26

3. Occupational Literacy Industrial Survey (Phase I)

3.1 The Survey Design 28-29
3.2 Analysis of the Employer Questionnaire 30-39

4. Provincial, Regional and Sectorial Data Analyses 40-77

5. College Consolidation (Phase II) Into Learning Objectives

5.1 Background 79-83
5.2 Terminal Performance Objectives 84-94

6. Linkage of the Survey Findings and Learning Objectives 95-101

Appendices

1. Anglophone Employers Surveyed
2. Francophone Employers Surveyed
3. Anglophone Survey Results
4. Francophone Survey Results
5. Provincial Results
6. Regional Results
7. Sectoral Results
8. Anglophone Occupational Sector Job Positions
9. Francophone Occupational Sector Job Positions
10. On-Site Points of Observation
11. OBS Terminal and Enabling Objectives
12. FBO Terminal and Enabling Objectives
13. Acknowledgements

CHAPTER 1.

REVIEW OF THE LITERATURE

REVIEW OF THE LITERATURE

The nature of work in Canada and other industrialized countries is changing. As new jobs are created and old jobs disappear new levels and types of basic skills for employment are required. This changing nature of work coupled with the current public awareness of the extent of literacy in Canada has increased the concern of provincial governments. This concern has been expressed in a number of positive ways. For example, in Ontario, the Ministry of Skills Development introduced the Ontario Basic Skills program. This type of training and retraining of people for success in occupational roles is a complex and difficult one which engenders considerable debate on the topic of functional job literacy or occupational literacy. To better understand the origins and dimensions of the concept, this section of the report attempts to discuss three related areas: understanding what literacy means, occupational literacy research findings, and basic skills for the work place.

UNDERSTANDING WHAT LITERACY MEANS

Many attempts have been made to define and determine the extent of functional illiteracy in Canada and the United States. The Canadian Business Task Force on Literacy (1988) indicated that there are currently a large number of definitions of literacy and illiteracy in use which correspond to many different contents in which literacy related issues arise. For example, definitions often relate to the individual's ability to function within the business and societal context. Nesbitt (1987) maintains every study or commission involved in assessing literacy must struggle with its precise definition since no generally accepted definition of literacy yet exists. Literacy and illiteracy are rarely absolutes. Illiteracy does not necessarily mean "the complete absence of the ability to read" and literacy encompasses a broad spectrum of capabilities for which absolute attainment is difficult to achieve or infer. At the very basic level are the simple decoding skills and at a higher level are the skills involved in aesthetic appreciation and study. Literacy then, is not a single skill but a set of complex information skills (Nesbitt, 1987, p.3).

Miller (1987) purports that there are two general types of literacy definitions a) conventional involving simple reading and writing skills and b) functional, where a more complex set of skills and proficiencies is used as the standard. At one end of the continuum is basic literacy, or what some authors refer to as conventional literacy. This is the stage at which a person's ability to read and write is limited to very simple tasks such as reading and writing one's name and address, recognizing and understanding social sight words and writing simple sentences for communication purposes. Literacy is confined at this stage to simple "survival" skills of reading and writing. Hunter and Harman (1987, p.7) define conventional literacy as the ability to read and write and comprehend texts or familiar subjects and to understand whatever signs, labels, instructions and directions are necessary to get along in one's environment.

As we move from conventional literacy we come to a stage known as functional literacy. Implied in the definition is a critical threshold which once reached enables a person to handle the tasks of everyday life with confidence and responsibility. The term "functional illiteracy" began to be used during the 1940's and 1950's to describe persons who were incapable of understanding written instructions necessary to accomplish tasks or functions. In particular the U.S. Army used texts to distinguish World War II trainees who needed additional educational training before they could comprehend military instructions. The conventional definition of literacy proved insufficient for making these distinctions.

Definitions of functional literacy depend on specific tasks, skills or objectives thought necessary for the comprehension of a literate person. As various experts defined clusters of "needed" skills, definitions proliferated. These definitions became more complex as the technological and information needs of society increased. According to Hunter and Harman (1979, p.9) functional literacy is "the possession of skills perceived as necessary by particular persons and groups to fulfill their own self determined objectives as family and community members, citizens, consumers, job holders, and members of social, religious and other associations of their choosing. This includes the ability to obtain information they want and to use that information for their own and others' well-being; the ability to read and write adequately to satisfy the requirements they set for themselves as being important for their own lives; the ability to deal positively with demands made on them by society; and the ability to solve the problems they face in their daily lives."

The recent study conducted by the Southam Press used the following definition: "the term illiterate refers both to adult Canadians who can barely read and write called "basic illiterates" and also to those whose reading and writing and number skills are not sufficient to get by in everyday life called "functional illiterates". The study used an operational definition of literacy based on a series of tests of actual reading skills instead of using educational attainment as a measure. Using the Southam study results, the functional illiteracy level of 4.5 million adult Canadians (24%) is somewhat more than that which is derived by using the criterion of persons with less than grade 9 (21% according to the 1981 Census). The Southam study showed that using the grade 9 criterion there are approximately 1.7 million who are wrongly labelled illiterate and a further 2.4 million who should be classified illiterate but who have levels of education of at least grade 9. (Canadian Business Task Force on Literacy, February 1988, p. 9).

Shortcomings of the Grade Level Equivalency Measure

Some researchers have attempted to define literacy by linking it to a grade level of performance. Harman (1987, p. 8) reported that "researchers have sought to identify a level that would form the benchmark of functionality and have variously proposed standards ranging from a fourth to a twelfth grade level. Mikulecky (1987) explains that U.S. government agencies simply use grades completed in school as a measure of literacy. Smith et al (1986) indicated that National Health Surveys suggest fourth grade is literate, the U.S. Census suggests sixth grade is literate and the Department of Education suggests eighth grade is literate.

In Canada the grade level and equivalency measure has also been used. In the late 70's, using the UNESCO proxy, organizations like the Canadian Association for Adult Education have considered the equivalent of at least the eighth grade of educational attainment necessary for functional literacy and Statistics Canada have defined illiteracy as having less than Grade 9 education. (Thomas, 1983; Calamai, 1987). The unacceptability of this type of approach is highlighted by Kirsch and Gutherie (1977-78) who maintain that the average grade scores of eighth graders in Chicago range from 4.4 grade level in the lowest school to a median level of 10.5 in the best schools. Darling (1981) made an even stronger case for unacceptability by noting that of students registered for adult basic education in Jefferson County, Kentucky, the median grade completed was 8.6 but the median tested reading grade level of entering students was 2.0.

As Nesbitt (1987) explains studies involved in determining literacy have adopted a criterion measure of functional literacy - performance below which is judged to be functionally illiterate. One of the serious problems with such a grade equivalency measure is the fluctuating standards for a given grade level. (Literacy in Canada, 1987, p. 4). In a similar vein, Calamai (1987) reported that research also reveals that reading skills evaporate if unused for a lengthy period of time; a grade 9 education in the 1960's could have shrunk to a much lower reading level by today. Other studies have also found as much as a year's difference between the reading levels of Grade 9 students in different schools. Most experts now reject the grade level approach to literacy used by Statistics Canada and UNESCO. (Calamai, 1987).

Central Issues Related to Definitions of Literacy

In a recent report to the U.S. Office of Educational Research and Improvement, Valentine (1986) addressed the issues central to definitions of literacy. He pointed out that much of the confusion derives from the fact that there is little agreement upon what skills comprise literacy. For example, which clusters of skills comprising reading and writing are essential? One can side-step the issue of what skills comprise reading and writing and simply look at materials people are able to or unable to read and write. This however creates another problem of definition: Literacy is being able to read and write which materials? Bormuth (1975) suggested that the list of materials will always differ from person to person and situation and therefore offers the definition of literacy as "the ability to respond competently to real world reading tasks" (p. 65). Gutherie (1983) expands on this notion by noting that the reader's literacy depends on the context of the situation not on a specific achievement level.

Bormuth (1975) also notes that "there is no true definition of literacy. Rather each definition must be designed for the purpose to which it is to be put to use, and its correctness may be judged only in terms of how well it serves that purpose. (p. 70). According to Lytle et al. (1986; the best definition, at least in terms of accurately reflecting the social and cultural nature of literacy, would be those that (1) emanate from individually defined goals and purposes and (2) view literacy as a process not a product. As Fingeret (1984, p. 9) explains "to establish a national set of standards for a concept that is relative in relation to time and culture will, to some extent, undermine efforts to develop literacy programs that are appropriate to the varying needs of adults in their social contexts".

Because of the pluralism of North American values a common operational definition may not be feasible, but as Thomas (1987) points out, there appears to be more or less general agreement on some of the underlying principles of adult literacy. First, grade level completion measures are inadequate for definition purposes. Second, there is a literacy continuum ranging from the mechanisms of learning how to decode and encode to the mature utilization of literacy skills and processes for informed action and aesthetic appreciation. Third, with a few exceptions, there is general agreement with the principle that literacy should be defined as the ability of individuals to function within a specific social economic or cultural context. Fourth, in an increasing technological and changing North American society, literacy thresholds are likely to be in a continuing state of flux.

It would appear that one uniform definition of adult literacy is not appropriate for Canada, but, as Harman (1987) suggests, what is useful is, "a plethora of definitions each appropriate for a specific community at a particular time. Such definitions ought to reflect environmental norms, expectations regarding literacy and objective conditions. Functional literacy needs to be defined both for individuals and for communities". (p. 11).

OCCUPATIONAL LITERACY RESEARCH

Occupational literacy development is a vital aspect of prevocational, vocational and on-the-job-education. Rush, Moe and Stolie (1986) define occupational literacy as the ability to competently read required work related materials. The definition derived from Kirsch and Gutherie (1977-78) proposed that functional literacy be defined according to the demands of specific situations in terms of competency in reading alone, but more recent research into occupational literacy has included listening, speaking and writing as literacy related competencies. Spikes and Cornell (1987, p. 181) explain that "beyond reading competence and with reference to the wide variety of occupations, occupational literacy is a term that should be perceived as "fluid" in terms of individual competencies related to situations."

General Job Analyses

By definition functional literacy varies according to individual demands of divergent roles, settings and materials. Occupational literacy competencies comprise a subset of functional literacy. Rush et al. (1986) maintain that required competencies vary from occupation to occupation and from job to job within occupations. Horne (1979) notes that efforts to gather information relevant to defining occupational literacy have been categorized as either general job analyses or designed specifically to provide information on functional job literacy. Although numerous general tasks analyses have been done (Boyce, 1976; Howell, 1976; Hawes, Hawes and Flemming, 1977), these summary task statements seem to be arbitrary, with most of the requirements stated in general terms - highschool education, GED, college courses. Mikulecky and Diehl (1979) maintain that such summary statements provide little information about actual literacy requirements of jobs. Horne (1979) added that general job analyses done in business, industry and the military involve questionable methodologies and are too general to be useful in determining specific functional literacy skills. Another difficulty with general task analyses is that they are typically based on representative tasks rather than actual tasks. According to Jacob and Crandall (1979) a structural description or typical job description is not sufficient to define the functional literacy requirements of a job, since these actually focus on routine or recurrent aspects of the job and tend to omit the miscellaneous tasks which so often involve reading.

Specific Literacy Demands

Sticht's work has been conducted in the area of specific literacy demands for individual occupations. Within the military environment, the research of Sticht et al. (1971) focused on determining the literacy demands of jobs, determining the relationship between literacy ability and job ability, developing reliable and valid testing procedures for matching individuals with jobs and developing ways of restructuring materials to reduce the literacy demands. As well, research has been conducted to distinguish between the two dominant uses of reading in occupational settings: reading to-do-tasks and reading to-learn-tasks (Sticht 1975; 1978). They differ in that the former are used to accomplish work while the latter involve retention of information for later use.

In translating this concept into practice, Mikulecky, Ehlinger and Meenan (1987) are now advocating learning activities that stimulate literacy requirements on jobs. They are suggesting that learners must have opportunities to use the types of reading comprehension required on jobs including:

- Reading to accomplish a task: For most blue collar workers, much job-related literacy involves reading information to accomplish a task. Once the job is completed, the information can be and usually is forgotten.
- Reading to learn: Information which must be retained for later use.
- Reading to access: Examining material to determine its use for a task.
- Other important types of reading required for job literacy include reading to gain background knowledge, analyze problems, advise customers and solve problems.

Research on specific literacy demands for individual occupations in the civilian sector has tended to be minimal. Some of the areas of investigation have included literacy requirements necessary to hold different occupations, reading demands of the plumbing trade and clerical positions, and communication competencies required for future business people. (Moe, Rush and Storlie, 1979; Chang, 1983; Spicer, 1975). In criticizing these studies, Jacob and Crandall stated that it is important to observe and interview more than one representative of a job, and to use appropriate instruments to examine the difficulty of reading materials in order to create a valid profile of the reading demands of that occupation and the strategies which individuals in those jobs use to fulfill those demands. It has been recommended that the procedure should involve interviews with individuals in the actual environment where the reading is done, observation for verification and the use of more than a formula to determine the difficulty of reading materials.

Occupational Reading

Kenter (1986) claims that as the work place becomes complicated, requiring higher specialized skills and training, the definition of illiteracy will have to be broadened to include those who can't meet the new work place requirements. Current estimates of occupational demands for literacy indicate that over 90% of occupations call for some reading and writing. (Mikulecky, 1982). Further 70% of occupations require reading at a grade 9 - 12 level. Only 15% of occupations require reading levels below the grade 9 level. (Mikulecky, 1984). Researchers have found the average work place requires not only the ability to read, write and compute but also the ability to use those skills in problem solving situations. The average worker must read and skim a wide variety of materials to solve problems and make decisions. This is in contrast to the school environment where the student is reading primarily to gain literal facts.

Mikulecky (1982) reported that most jobs require about two hours of reading per day ranging between a grade 10 and grade 12 level. Even blue collar workers were reading about 97 minutes per day; these employees were reading forms, directions, order forms and printouts. A retail or clerical worker was found to read about three hours daily. Most categories of workers in fact read more than most students. Only 2% of occupations examined required no reading or writing. (Mikulecky, 1987). These findings concur with the research of Rush, Moe, and Storlie (1986) and other civilian and military settings. Though having a wealth of background knowledge on a topic can tend to effectively lower reading difficulty levels, the most heavily job-related reading is performed by new workers least likely to have the wealth of background experience.

The uses to which literacy is put on the job appear to be more complex than typical uses of literacy in schools. The vast majority of school related reading is reading to learn factual material, while a comparable majority of job-related reading is for problem-solving and making applications. (Mikulecky, 1982). In addition the literacy strategies associated with high job performance ratings are primarily higher level metacognitive strategies involving monitoring, focusing and managing information. (Mikulecky and Ehlinger, 1986).

Writing and Other Competencies

Diehl (1980) reported that in 64.7% of occupational writing examined, the task involved completing simple forms or preparing brief memoranda. Writing tasks were repeated enough for workers to master the most complex forms. Memoranda were simple, concise and relatively easy to write. Diehl suggested that further research may show that writing competencies required for successful job performance are simple, and unrelated to the writing tasks observed in schools.

The nature of listening competencies required at work has received little attention from researchers. Sticht (1975), however, described studies which show that military personnel learn equally well through listening or reading and noted that it is possible for such personnel to learn from tape recordings played at accelerated rates. A general sense of the importance of listening skills in occupational settings can be inferred from studies of adults in general. Rankin (1926) indicated that 70% of daily activities involve oral communication and 45% of communication involves listening. The amount of oral communication time typical of occupations varies considerably, but it seems likely that about 50% of such time requires listening.

BASIC SKILLS FOR THE WORK PLACE

Interestingly, the industrial literature offers little in the way of a list of the adult basic skills required in business and industry. Even though more and more companies are "training workers at all levels in job-specific literacy skills" (Sticht and Mikulecky, 1984), no satisfactory, fully articulated list of adult basic skills for industry's need is available.

There are numerous reasons for this lack of information. Some companies choose not to address basic skills deficiencies and refer employees elsewhere for help. Other companies refuse to admit that such deficiencies exist. Another major reason is that rapid change in technology and related jobs requirements make it difficult to predict changing skill needs. Any attempt at a comprehensive list would be subject to frequent alteration. Hull and Sechler (1987) maintain that the skills deemed essential for the service, financial and other growth sectors are unlike those common to the rapidly changing manufacturing sector. In short different industries emphasize different occupationally relevant skills. According to Mikelucky (1985) another reason is that the link between job performance and literacy is a subtle one. To a large extent research on this relationship is sketchy and is based mostly on literacy task analyses as mentioned in the previous section. Kulp (1974) found, in a controlled study that performance of an assembly task decreased significantly when worker reading skills were more than two grade levels below the difficulty level of instructions. Sticht (1975) reported correlations of reading ability to job sample performance that range from $r=.26$ to $r=.37$. These correlations are significant but only explain from eight to thirteen percent of the job performance variance. A good deal more than basic reading ability as measured by a reading test is needed to explain job performance ability. In a testing and observational study of the relationship between job performance and literacy abilities among nurses, Mikulecky and Winchester (1983) note a similarly low correlation between measured ability and job performance. A much higher relationship was noted, however, between job performance and the ability to apply and use reading, writing and computation skills critically. This same call for higher level use of basic skills may be present in many other occupations.

However, in public sector studies, training journal articles and the basic skills research done by the U.S. military there appears to be agreement as to the general areas of literacy skills needed by employees. (Patterson and Pulling, 1981; Timpane, 1982; Henry and Raymond, 1983).

For example, Oinonen (1984, p.31) surveyed Wisconsin employers and employees who reported that the following skill areas were in need of improvement and greater emphasis:

- basic skills of writing, spelling, grammar, mathematics and reading (including interpretation of blueprints and instructions)
- effective speech and oral communication
- economics of business and knowledge of business operations
- technology or applied science
- applied computer literacy
- flexibility and adaptability to learn new skills
- human relations and decision making abilities
- application and job interview skills
- general positive attitudes toward work
- knowledge of career ladders and career planning
- work experience
- specific occupation and job entry skills

Another example in the military is the Jobs Skills Education Program which systematized basic skill competencies by occupational specialty. With the assistance of 1500 subject matter experts, 300,000 task steps in 94 military occupations were related to 203 academic competencies. The competencies were grouped in two ways: in a common table with math and verbal areas as well as, in a Military Occupational Profile under basic skills categories. The categories for the common soldier tasks were as follows:

- numeration / place value
- units of measurement
- visual / spatial relationships
- geometry
- computing and performing math processes
- content reading
- information access
- visual aids perception
- written communication
- verbal communication
- safety / security
- perceptual processes

As the literature suggests in general terms the different areas of literacy skills needed by employees fall into the broad categories of reading, writing, speaking, listening, mathematics, reasoning, decision making, problem solving, computer literacy and safety awareness. For some industries, introductory levels of science skills and knowledge also apply.

In a recent study conducted by the National Center for Research in Vocational Education, Hull & Sechler (1987) reviewed the adult literacy skills needed in the work place and classified those needs according to type of skill. The information was gathered through a literature search, site visits and face to face interviews with company officials, training program administrators, instructors of literacy skills and employee participants. Generally, the results indicated that higher level skills are needed in today's work force than 5 years ago. The authors suggest that as more companies convert to more complex equipment, employee skills must be upgraded. Basic literacy skills serve as prerequisites to the learning of more technical knowledge. This knowledge is specific to types of equipment and industries but the underlying literacy skills tend to be somewhat generic. Company managers, instructors and trainers identified the following skills necessary for successful job entry:

- reads, writes and counts (math-related)
- add, subtract, multiplies and divides numbers
- reads for facts and information
- write legibly
- completes forms and applications adequately
- signs forms appropriately
- writes dates and times correctly
- uses listening skills to identify procedures to follow
- applies information learned through listening
- speaks face to face coherently

Basic skills considered crucial to progressing in a job were the following (job progression can mean either working effectively on a job that is being upgraded or getting a promotion):

- uses fractions and decimals
- converts fractions to decimals / decimals to fractions
- measures with accuracy using English and/or metric
- solves problems using numbers, fractions and decimals
- follows written instructions
- read for ideas, logic and meaning
- draws conclusions from statements read
- can detect bias and inconsistencies
- capitalizes words correctly

- spells correctly
- punctuates with commas, colons, and semi-colons and uses quotation marks correctly
- writes legibly
- writes sentences and paragraphs
- signs forms appropriately
- identifies procedures to follow
- understands concepts, technical information
- is attentive
- applies information learned
- identifies additional information needed
- distinguishes relationships
- selects words appropriately
- has adequate vocabulary
- speaks face to face coherently
- gives information / directions clearly (p. vii-viii)

Developing Occupationally Related Basic Skills Program

According to Sticht and Mikulecky (1984) experience in research and operational projects to develop basic skill training programs in business and military settings has led to the emergence of several conceptual and procedural factors. Worthy of mention for this particular Training Profile Project are two principles for further program development: (1) providing training in basic skills within a functional context and (2) using a competency-based, mastery learning instructional approach where possible.

The functional context principle states that skills and knowledge are best learned if they are presented in a context that is meaningful to the person. Thus, rather than teaching students who need job-oriented basic skills to read and write and compute using general literacy materials, it is better to use job reading and numeracy materials and tasks. The more similar the basic skills training tasks are to the actual job tasks, the greater will be the likelihood that the training will pay off in improved performance of job literacy tasks. As Sticht and Mikulecky (1984) point out for adults aiming at work in a given industry or organization, the use of job related materials serves two purposes. It provides a functional context so that the learner can see that the materials are relevant to the employment goal. Secondly, the organization can see that the training is relevant to its needs and that there is some likelihood of the trainees actually becoming competent in the performance of job-relevant skills.

The competency-based mastery learning principle actually contains two main ideas. Competency-based refers to the idea that the skills and knowledge to be taught in the basic skills program should be derived from domains relevant to the person's occupational setting. Further, in competency-based learning, a person's learning goals ought to be stated in terms of acquiring the competencies needed to perform the tasks of the job literacy, i.e. oral or numerical domains, rather than some external referent such as a grade school level or percentile score. (Sticht and Mikulecky, 1984, p. 33). The second main idea contained in the competency-based mastery learning principle, "mastery learning" has to do with setting standards of competency. Shelton (1987) maintains that the criterion for success in this approach is demonstrated competence in reaching particular goals (criterion- referenced) as opposed to scoring as well or better than members of a group (norm-referenced). While the concept of mastery is useful as a goal for program operations, it frequently happens that, due to various factors such as limited time, not all trainees can be expected to learn all tasks to the mastery standard. According to Sticht and Mikulecky (1984) it is important to know whether mastery is underachieved due to lack of relevant knowledge about how to accomplish the task, the requisite knowledge needed to do the task, or to a slowness of skill in accomplishing the task. Despite some of the limitations of their approach, it has emerged from both work reported and the experience of others as an important goal to be sought in the development of basic skills programs for adults.

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CHAPTER 2.

OVERVIEW OF THE TRAINING PROFILE DEVELOPMENT PROJECT

2.1 BACKGROUND

OVERVIEW OF THE TRAINING PROFILE DEVELOPMENT PROJECT

Background

There were a number of reasons for undertaking this project. First, we wanted to delineate the character of the OBS/FBO program, that is, as an occupational rather than an "academic" literacy[1] program. With a clear occupational focus both the public and the program deliverers would have a better understanding of the nature of the program.

Second, there was a need to define the end points (known as terminal performance objectives) of the various subject areas. This would serve to assure that all of the colleges were delivering, in broad terms, essentially the same program.

Third, there was a need to articulate Ministry expectations for the less established subject areas of the program, e.g., computer literacy, work-adjustment skills and hands-on technical exposure.

Finally, in order to meet the above goals, we needed to have a clearer and a common understanding of our frame of reference for "occupational literacy".

Project Objective

The project was designed to develop terminal performance (learning) objectives and enabling objectives for the OBS/FBO program at three levels of achievement - Basic, Intermediate and Advanced. These objectives were to reflect the competencies required by workers at three corresponding functional levels on the job in a variety of occupational sectors. With the objectives established, there would be a common base for subsequent curriculum and materials development by the individual colleges in the delivery of OBS/FBO.

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[1] As it applies to this project, "literacy" in relation to OBS/FBO includes numeracy and other skills.

2.2 CONCEPTUAL FRAMEWORK

CONCEPTUAL FRAMEWORK

The Literacy Continuum

A number of key decisions were required at the outset.

Though there is the expectation that, on average, OBS/FBO clients will not exceed 400 hours duration in the program[2], we decided that we should not try to force-fit a literacy program into the constraints of the existing program. Rather, the task was conceived in terms of developing a continuum of learning from the base of illiteracy to the level of literacy, however the latter was to be eventually defined. Trainees would enter the program at any point along this continuum and proceed upward as far as possible within the constraints of their respective abilities and circumstances.

Proceeding upward on the continuum does not mean that trainees would necessarily complete all of the learning objectives in a given level. Depending on the identified career or occupational target, trainees would select from the spectrum of objectives those crucial to their goal. In fact, many trainees are learning at several levels simultaneously, for example, whole numbers at the Basic Level and report writing at the Intermediate Level.

Our literacy continuum had to accommodate the upgrading needs of three broad client groups, as prescribed by the OBS/FBO Program Guidelines:

(a) those bound directly for employment
(b) those wishing to qualify for skills training or apprenticeship
(c) those wishing to qualify for post-secondary programs normally requiring the equivalent of a grade 12 prerequisite.

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[2] There is flexibility to exceed the normal 400 hours, depending on a variety of factors.

The three levels of the OBS/FBO program were originally designed to equate roughly with the three foregoing groups, i.e. group (a) with the Basic, group (b) with the Intermediate and group (c) with the Advanced. Because this construct had already taken hold in the program, we elected to retain it. It seemed to provide natural exit points from the program and afford trainees benchmarks of achievement. The parameters of these levels proved to be less natural, pedagogically, at the lower levels.

For practical reasons, the ceiling of our literacy continuum was equated with the exit competencies required by trainees at the Advanced level. In other words, the learning objectives had to meet the needs of those bound for post-secondary skill programs.

The Training Plan Concept

The selection of a trainee's specific learning objectives is governed by an Individual Training Plan developed for each trainee at entry to the program. The trainee is first assisted in identifying a realistic career target. Then, following an assessment of the trainee's functioning level, learning objectives are identified to take the trainee as far as possible toward his or her goal. The process of selection of specific learning objectives is known as the educational prescription, or, educational contract. The concept of the Individual Training Plan is central to the OBS/FBO program in that it streamlines the learning content and emphasizes its relevance to the occupational goal. Other benefits identified by the program deliverers include heightened trainee commitment to the learning by virtue of agreeing to the plan, and, a lower attrition rate.

The Question of Grade-Level Equivalency

At the outset we decided that the product should not be driven by the need to relate to grade-level equivalency, although it may be possible for other agencies to grant equivalency. We were convinced by the mounting evidence, that grade level equivalency was not the appropriate approach for an occupational literacy program for adult learners.

Project Methodology

There were two phases to the project.

First was the development and administration of a questionnaire to employers in given sectors to identify the generic basic skills required by their employees. The second phase was the development of the performance objectives for each of the subject areas of the program at each of the three levels of achievement. The subject areas were communications, mathematics, science, computer literacy, work adjustment skills and technical hands-on exposure. The occupationally-defined competencies were to be developed in a "spiral", that is, with increasing complexity relative to the level.

CHAPTER 3.

OCCUPATIONAL LITERACY INDUSTRIAL SURVEY

3.1 THE SURVEY DESIGN

SURVEY DESIGN

The Survey Instrument

To obtain information on the generic skills expected by employers, a questionnaire was developed, in English and French, drawing on input of employers, college faculty and Ministry of Skills Development staff. Following pilot testing of the questionnaire, staff of the colleges' OBS/FBO programs conducted personal interviews with employers across the province in nine designated occupational sectors. The sectors were: Construction, Finance, Government / Education, Health Care, Manufacturing, Natural Resources / Utilities, Service / Hospitality, Transportation and Wholesale / Retail.

Sample

Information was collected on the literacy and related competencies required to function competently at three occupational levels - semiskilled, skilled and paraprofessional.[3]

For the survey of anglophone employers, each region of the province was assigned five occupational sectors to interview. The distribution of sectors was as follows:

Region	Sectors
North	Wholesale/Retail, Health Care, Natural Resources, Service, Transportation
Central	Construction, Finance, Education/Government, Manufacturing, Transportation
East	Wholesale/Retail, Health Care, Service, Education/ Government, Transportation
West	Construction, Finance, Manufacturing, Natural Resources, Transportation

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[3] For this project, semiskilled is defined as requiring no formal vocational training (e.g. caretaker, general laborer); skilled as requiring formal skill training (e.g. apprentice plumber, cook, precision electronic assembler); paraprofessional as training to assist professional level practioners. (e.g. automotive parts manager, computer operator, health care aide).

3.2 ANALYSIS OF THE QUESTIONNAIRE

ANALYSIS OF THE EMPLOYER QUESTIONNAIRE *

In Part A of the questionnaire, college representatives conducted one hour face-to-face interviews with employers, asking questions categorized into seven areas: General Information, Communications, Mathematics, Science, Computer Literacy, Work Adjustment Skills and Technical Hands-On.

Part B documented observation points during an interviewer's tour of that same company or organization. Actual reading, writing, oral and other linguistic practices observed at a given point in time were recorded.

PART A

SECTION 1: GENERAL INFORMATION

1. Eleven Ontario colleges of applied arts and technology participated in the collection of employer information: George Brown, Lambton, Loyalist, Cambrian, Georgian, Confederation, Northern, Algonquin, Fanshawe, St. Lawrence/Saint Laurent and Durham.

2. The interviewers comprised OBS/FBO coordinators, instructors and counsellors from the four regions. Interviews were conducted either individually or as a team.

3. Each interviewer was instructed to interview employers from designated sectors and to record the interview number as a data collection procedure.

4-7. Company Name, Address, and Type of Business has been compiled in Appendix 2.
This information served two purposes. It provided an overview of regional employers who contributed information on the literacy and related competencies of their employees, and it outlined a cross section of businesses, companies, firms and organizations having distinct occupational levels, each requiring different types of employee competencies. This information may help depict the work place environment of successful OBS/FBO trainees.

8. This item provided the sectoral breakdown of employer participation. Preliminary analysis reflected the percentage of employers interviewed for the project. Final analysis figures were broken down by sector and appear under a different section.

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* See Appendices 3 and 4 (Anglophone/Francophone Survey Results) for questionnaire design.

9. This question described the size of the companies or firms interviewed. Figures were available for the preliminary analysis only. College interviewers were asked to balance the number of small, middle and large companies interviewed.

10. Figures for the preliminary analysis were read as the total number. In the final analysis, 3/4 of all fifty-eight francophone firms/companies interviewed used both English and French. Other languages recorded by anglophone employers were German, Finnish, Italian and Portuguese.

11.A Employers interpreted this question in a variety of ways. Therefore, the data was not analyzed in the same format as it appears in the questionnaire.

11.B Not all employers responded to this question. The minimum educational requirements for hiring as reported by employers are described below. For most sectors, a range of responses were given. It is interesting to note that even within sectors minimal educational requirements vary to a large degree. The exception is Finance. All employers interviewed in this sector reported a grade 12 minimum. At least 60% of other sector employers reported a grade 8 minimum. Both grade 10 and grade 12 were mentioned by all employers as the basic educational requirements for hiring.

SECTOR	GRADE MINIMUM EXPECTED		
Construction	8	10	12
Finance			12
Government/ Education	9	10	No Minimum
Health Care	8	10	12
Manufacturing		10	No Minimum
Natural Resources/ Utilities		10	12
Service/Hospitality	8	10	12
Transportation	9	10	12
Wholesale/Retail	8	10	12

For francophone employers, fewer reported grade 8 minimums and the majority mentioned grade 10 and grade 12.

SECTEUR	GRADE MINIMUM EXPECTED		
Construction	8	10	12
Finances			12,13
Fonction-publique education		10	12
Soins de santé		10	12
Fabrication		10	12
Ressources naturelles, services publics			10
Services, hôtellerie		10	12
Transport	8		12
Ventes en gros et au détail		10	12

12. The terms semiskilled, skilled and paraprofessional are bridging words of an occupational nature that were chosen to loosely correspond to the three achievement levels of the OBS/FBO program - Basic, Intermediate and Advanced. Employers were asked to identify positions in each of these occupational levels to assist in focusing their responses to the remaining sections of the questionnaire. Appendix 8: Occupational Sector Job Positions and Appendix 9 list the different jobs, according to occupational levels as reported by employers. This information provides examples of actual jobs which require a range of employee competencies. It may assist in linking performance objectives within the program's three achievement levels to competencies within occupational levels. As further curriculum design strategies are implemented, the examples may help to focus classroom exercises on samples of sectoral jobs.

SECTION II: COMMUNICATIONS

This section of the questionnaire addressed employee tasks of reading, writing and other linguistic competencies (Questions 13, 14, 15). For question 13C, anglophone employers also suggested the following additional references: code of company operating practices, VCR's, charts, regulations, instructions, computer cash registers and video discs. For question 13C, francophone employers suggested cartes geographiques, microfilm, dossiers du malade, radiographie.

The total number of employers (N)* who responded to each type of work task within each occupational level varies slightly. Not all companies or firms had employees in the three distinct occupational levels. The total N of semiskilled was 218. The total N for skilled was 234. The total N for paraprofessional was 131. Clearly some employers identified professional positions instead of paraprofessional when responding to individual work tasks and competencies. Consequently, that data was not included in the analysis.

The figure appearing in the column corresponding to a specific task is a percentage. It is read as follows: 92% of the job entry employees classified in a semiskilled occupational level are required to read notes in their work setting. The total N for francophone questionnaires* was semi-spécialisé (45), spécialise (54), professionel (36).

SECTION III: MATHEMATICS

Questions 16, 17, 18 and 19 refer to work tasks or competencies of a mathematical nature. The total number of employers who responded to these questions is the same as for Section II: Communications. Figures are read as follows: 97% of the job entry employees classified in a skilled occupational level count whole numbers in their work setting.

SECTION IV: SCIENCE

The total N for questions 20, 21, 22 and 23 is the same as for Section II: Communications. Figures are read as percentages. In questions 20 and 21 an open-ended category of OTHER was included. Responses to question 20 included Infection Control, Dangerous goods, Hydraulics, Pneumatics, and Plant Maintenance. No additional responses were given for question 21. Francophone employers gave no additional responses for the category OTHER in questions 20 and 21.

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* The total N does not match the number of questionnaires analyzed (259 English, 60 French). Some questionnaires were deleted from the sample due to uncertainty of interpretation.

SECTION V: COMPUTER LITERACY

The total N for questions 24, 25 and 26 is the same as Section II: Communications. Figures are read as percentages.

For questions 27, 28, 29, 30 and 31 the percentages are based on the total number of companies/firms rather than by occupational level. Total N = 264. In question 30, a large number of employers mentioned additional software packages. By sector, some of the more frequently cited responses included:

Construction:

AC Pac., Basic, Framework, Multimate, Microsoft Word

Finance:

Propriatory Bank System, Symphony, Ramis, Master Graphics, Spot Light, Side Kick, Redshawe, I.T.T., Insurance Broker's, Custom Main Frame System, NCR, Focus, Multimate, Bedford Accounting.

Government/Education:

Symphony, Display Write, AES, MDBS, Choices, Eptcom, Apple Works.

Health Care:

Supercalc, AC Pac, Crosstalk

Manufacturing:

Custom, Basic, Picture Perfect, Anvil NICAM, Powerhouse Express, Venture, J.D. Edwards, Focus.

Natural Resources/Utilities:

Display Write, Auditor, Enable, Symphony, Smart Norplot, Picture Perfect, Chartmaster, Diagramaster.

Service/Hospitality:

AC Pac, Wind and System, Apple Works, Solutions, AES, Saturn PRO, Saturn Calc, Volkswriter, Deluxe, Printmaster, P.C. File.

Transportation:

BPA, Display Write Symphony, Word Wand, PICK, Easy Writer, Path Mind.

Wholesale/Retail:

NCR, AC Pac GW Basic, Basic 4, Disoss Electronic Mail, Speed Script, Word PRO, Insta Leger.

For francophone data the total N was 58 for questions 27, 28, 29, 30 and 31. Additional software packages reported in question 30 were:

AC Pac
Symphony
Legal PRO
Audit 4
Data Base
Reflex
Quantel
Redshawe
Informatrix
AES
Desk Team
Display Write
PC-Write
Microsoft Word
MAI
Bedford
McRight
Magna Z
New View
Excel

In question 31 employers were asked about the company's micro-computer equipment. Responses included information on main frames, other equipment and packages.

Multi
Hewlett Packard
ADP
Texas Instruments
Cordata
Unisys
GEAC
Icon
North Star
Commodore
Epson Zenith
Sony
Atari
Reservax
Sony MAI
Ericcron
Digital
Nestar
Quantel
Adam
Helix
Honeywell Mini
Texas Instruments

Thirty-two francophone employers responded in a similar fashion.

Zenith
Icon
Computron
Rexon
Honeywell
Burroughs
AES
Commodore
CMQ
Rixdorf
Measurex
Panosonic
Olivetti
Digital
Sperry-Univac
Vax 11/750

SECTION VI: WORK ADJUSTMENT SKILLS

The total N for questions 32, 33, 34, 35 and 36 is the same as for Section II: Communications. Figures are read as percentages.

SECTION VII: TECHNICAL HANDS-ON

The total number of employers who responded to each question is the same as for Section II: Communications. Figures are read as percentages. Question 42 yielded a wide variety of additional tools and equipment. Some were general to occupational level and others were specific to a job. A major list is presented here.

- Electronic Testing Equipment
- Calculating & Computing Devices
- Survey Level
- Word Processors
- Hydrometers
- Electrical Discharge Machine
- Counting Machines
- Meat Grinders
- Paper Trimmers
- Sorting Machines
- Precision Measuring Devices
- Specialized Cleaning Equipment
- Mechanical Bathing Equipment
- Paint Sprayers
- Optical Flats
- Key Pads & Boards
- Fire Extinguisher
- Compass
- Suction Machines
- Comparators
- Soil Analyzer
- Proof Machine
- Micro Filmer
- Press Machines
- Fork Lifts
- High Pressure Washing Devices
- Impact Equipment
- Computerized Testing Equipment
- Computer Diagnostic Tools
- Drafting Equipment
- Culinary Tools

Francophone employer responses were as follows:

- Machine à écrire
- Calculatrice
- Micro-ordinateurs
- Télécopieur
- Trancheuse electrique à viande
- Machine à ouvrir les enveloppes
- Appareil mesurant les déplacements d'air
- Pompe pneumatique et électrique
- Terminal informatique pour banque
- FAX
- Photocopieuse
- Lecteur de microfiche
- Machine à dicter
- Cartes de crédit
- Caisse
- Couteaux divers
- Standard téléphonique
- Appareil de mesure de la pression hydraulique
- Materiel audio-visuel
- Gestetner
- Séchoir
- Cisèaux
- Affranchisseuse postale

Other Literacy & Related Competencies

The final question of PART A (question 43) gave employers an opportunity to express additional and related competencies not covered in any of the subject sections. Most employers highlighted certain tasks and competencies already discussed in the questionnaire. For example, some employers stressed the importance of oral communication skills on the job, critical thinking skills and work reading related to safety procedures.

Within the area of communications, a large number of employers felt that the following attributes were important on the job: people skills, receiving constructive criticism dealing with confidentiality, being able to work with minimum supervision, ability to think through a situation, avoiding confrontation, team skills and having a commitment to one's work.

Across the sectors, employers expressed a need for employees to have many of the competencies outlined in the Work Adjustment Skills Section. Organizational abilities, self appraisal of skills, work ethics, dependability, interpersonal skills, positive work attitudes and decision making skills were often cited by employers as being important for effective employees. Another general trend across all sectors at the semiskilled and skilled levels was the employer-rated importance of work placements for future employees. And on a slightly different note, several employers commented on the unrealistic expectations of students while on work placements.

Some employers noted the importance of the following competencies: company salesmanship, map reading, knowledge of how the pay roll works, customer contact skills, proper use of tools, specific terminology for a particular job and knowledge of first aid. As well, some employers mentioned the need for workers to have the ability to respond to change and to acquire interpretive skills.

Similar kinds of comments were raised by francophone employers. Concerns focused on: écriture lisible, aptitude à lire bonnes manières correctement des instructions, au téléphone, facilité d'expression verbale et écrite, sociabilité, bilinguisme, hygiène, ponctualité, initiative, initiative personnelle et organisation du temps.

PART B

ON SITE OBSERVATIONS

During the organization or company tour, several points of observation concerning actual practices of literacy and related competencies were recorded. Caution should be used when referring to the examples of practice. These observations were made at a given point in time and are based on the work practice of a few employees from one occupational level.

The information is recorded on the questionnaire under "Points of Observation". Two examples of actual communications practice from each occupational level appear in Appendix 10. Samples of actual reading and writing material from several of the sectors are available under separate cover.

CHAPTER 4.

PROVINCIAL, REGIONAL AND SECTORIAL DATA ANALYSIS

PROVINCIAL, REGIONAL AND SECTORIAL DATA ANALYSIS

"What the Occupational Survey Told Us"

For the purpose of this analysis the information will be divided into eight categories: reading, writing, other linguistic skills, mathematics, science, computer literacy, work adjustment skills and technical hands-on skills.

READING

Provincial Data Analysis

At the semiskilled level, firms indicated that employees in Ontario are most often required to read notes, letters and memos. They are also required to interpret work, job or purchase orders, schedules, charts and tables, and policy manuals, regulations and instructions. The skilled and paraprofessionals are required to read all of the same materials but in addition, reports, vouchers and claims.

The majority of semiskilled read to determine facts or information. The skilled and paraprofessionals must not only read to determine facts, but to determine opinions, purposes or implied meanings, to compare one selection to another and to evaluate sources of information. A greater percentage of paraprofessionals require these particular competencies than do skilled employees.

In general, the semiskilled are not required to gather information from references other than company manuals. The majority of the skilled and paraprofessionals are required to gather information from telephone directories, catalogues, dictionaries, technical references, company manuals and computer screens. A greater percentage of paraprofessionals require these competencies than do skilled employees.

Firms indicated that semiskilled employees are required to sort, file and store forms relating to parts and tools. Paraprofessionals and skilled employees must not only perform the same tasks, but also deal with correspondence, vouchers, invoices and expenditures. Handling correspondence is a particularly important aspect of the paraprofessional's job.

Regional Data Analysis

Regional results for reading skills are similar to those identified on a province-wide basis. The exceptions are listed below by occupational level.

Semiskilled Level

For the majority of firms, employees. . .

- Central: ... are required to read only notes, memos and work, job or purchase orders.
- North: ... are required to read reports.
- West: ... do not sort, file and store forms of any type.
- Central and West: - do not gather data from references or alternate resources.
- East and North: ... gather data from telephone directories and company manuals.

Skilled Level

- Central: Skilled workers must gather information from microfiche in addition to the other sources.
- West: Dictionaries and computer screens are not identified as sources of information for the majority of employees.

Paraprofessional Level

- Central and North: The majority of paraprofessionals are required to gather information from microfiche in addition to other sources.

Sectorial Data Analysis

As indicated previously, data was collected for nine industrial sectors to determine if variations exist in the literacy and numeracy competencies required of employees in different types of business and industry. This component of the analysis will identify variations from the provincial results for each sector.

Semiskilled Level

For the majority of firms, employees . . .

- Manufacturing: ... are not required to read work, job or purchase orders, schedules, charts or single column tables or policy manuals, regulations and instructions.

- Natural Resources: ... are required to gather information from telephone directories as well as company manuals.

- Construction: ... are not required to read schedules, charts of single column tables, policy manuals, regulations or instructions. They are not required to gather information from references or to sort, file or store forms.

- Transportation: ... are required to read vouchers, claims and simple reports, gather information from telephone directories and sort, file or store correspondence.

- Service: ... are not required to gather information from references.

- Health Care: ... are identical to the provincial results.

- Wholesale/Retail: ... are required to read vouchers, claims and simple reports, to read for opinions, purposes and implied meanings, to compare information from different sources, to gather data from telephone directories and catalogues and to sort, file or store correspondence. They are not required to sort, file or store forms for parts or tools.

- Finance: ... are required to read vouchers, claims and simple reports, to file, sort and store correspondence, vouchers and claims, to gather data from telephone directories but not from company manuals. They are not required to file, sort or store forms relating to tools or parts.

- Education/Government: ... are required to sort, file or store correspondence and to gather information from telephone directories, but not from company manuals.

Skilled Level

For the majority of firms, employees . . .

- Construction: ... are not required to gather information from dictionaries or computer screens.

- Transportation: ... are not required to gather information from dictionaries.

- Finance: ... are required to gather information from microfiches. However, they are not required to sort, file or store forms related to parts or tools.

- Education/Government: ... are required to gather information from microfiches.

  Manufacturing, Natural Resources, Service, Health Care and Wholesale/Retail: Sectorial data matches the provincial data.

Paraprofessional Level

For the majority of firms, employees . . .

- Natural Resources, Service and Finance: ... are required to gather information from microfiche.

- Education/Government: ... are required to gather information from microfiche but are not required to sort, file or store forms related to parts or tools.

  Health Care: The majority of paraprofessionals are not required to gather information from computer screens.

  Manufacturing, Construction, Transportation and Wholesale/Retail: Sectorial data matches the provincial data.

WRITING

Provincial Data Analysis

All three occupational levels require the ability to prepare short notes in the work setting. However, for the majority of the semiskilled, this is the only form of the writing required. The skilled and paraprofessionals must be able to employ a wider variety of writing formats including the preparation of internal memos, form letters, single paragraph letters, external multi-paragraph letters, estimates and reports. Writing skills are more critical for the paraprofessional than for the skilled worker.

Firms indicated that all three levels are required to fill in or complete forms using figures and words or short phrases. Skilled employees must be able to complete forms using sentences and to a lesser degree paragraphs. The paraprofessional must be proficient in all types of form completion.

The preparation of reports tends to be the responsibility of the skilled and paraprofessionals. Both of these occupational levels prepare reports that require presenting information. This presentation of information is the most common report requirement for skilled workers. However, the skilled must also prepare reports that require developing suggestions or recommendations, to research or gather information, to assess relevance of and analyze information. The paraprofessional must possess all the competencies identified for the skilled as well as being able to evaluate information.

The majority of skilled and paraprofessionals must also be able to develop a variety of formats to display information. This includes forms to record information and to show financial data. In addition, they must be able to design file systems that allow for easy input and retrieval of documents.

Regional

Similar to the Reading component of the survey, the regional data for writing skills closely resembles those of the provincial data. The exceptions are listed below by occupational level:

Semiskilled Level

For the majority of firms, employees . . .

- North: ... are required to use figures, short phrases and sentences to complete forms.
- West: ... are required to complete forms using figures only.
- Central and North: ... are required to prepare simple reports that show information.

Skilled Level

For the majority of firms, employees . . .

- West: ... are required to prepare only short notes and internal memos in a written format. They are not required to prepare file systems, forms for displaying financial data nor recording information.
- East, North and West: ... are required to evaluate information when preparing reports.

Paraprofessional Level

- All regional data corresponded with provincial results, with no exceptions being identified.

Sectorial Data Analysis

Semiskilled Level

For the majority of firms, employees . . .

- Manufacturing: ... are required to prepare simple reports to show information.
- Transportation: ... are required to prepare simple reports to show information and include suggestions and recommendations.
- Service: ... are not required to complete forms using short phrases.
- Health Care and Education/Government: ... are required to complete forms using sentences.
- Wholesale/Retail: ... are required to complete forms using sentences and prepare reports that show information.

Natural Resources, Construction and Finance: The sectorial data matches provincial data.

Skilled Level

For the majority of firms, employees . . .

- Manufacturing: ... are not required to prepare single paragraph letters, external letters, form letters, estimates, design forms, display financial data, record information, develop filing systems.
- Natural Resources: ... are not required to prepare external letters.
- Construction: ... are not required to prepare single paragraph or form letters, external letters, design forms to display financial data, record information or develop filing systems.
- Transportation: ... are not required to prepare single paragraph or form letters, external letters or estimates.

- Finance: ... are not required to prepare reports or estimates.

  Service, Health Care, Wholesale/Retail and Educational/Government: Sectorial data matches provincial data.

Paraprofessional Level

- Manufacturing, Construction, Transportation, Service, Health Care, Wholesale/Retail, Finance and Education/ Government: Sectorial data matches provincial data.
- Natural Resources: The majority of firms indicated that employees are not required to design forms, display financial data, record information nor prepare file systems.

OTHER LINGUISTIC COMPETENCIES

Provincial Data Analysis

The occupational literacy survey addressed the skills relating to speaking, listening and problem solving under the category "other linguistic competencies". Listening for facts, opinions, purposes and implied meanings are critical skills for all employees at all three levels. Similarly, giving and obtaining information by asking questions in the speaking component are essential to the three occupational levels.

The semiskilled further require the ability to give job-related instructions or directions, to engage in dialogue with their supervisors and to participate in formal meetings. The skilled require the same set of additional speaking skills but with greater emphasis, as these competencies are more common to the skilled compared to the semiskilled. The ability to make presentations and negotiate with fellow workers or customers are required of the skilled level.

Like the skilled worker, the paraprofessionals require all competencies associated with the speaking component of the survey. However, these competencies are more critical to the role of the paraprofessional, particularly those associated with making presentations, negotiating with fellow workers or customers and engaging in dialogue with supervisors.

The semiskilled required problem solving and diagnostic skills in a minimal number of job settings. No individual diagnostic skills were identified by the majority of employers as required components of the semiskilled individual's qualification.

The diagnostic/problem solving skills viewed as major components of the skilled and paraprofessionals include:

- identifying alternate causes of certain faults or symptoms;
- using reference manuals to guide in the selection of reasons for problems;
- establishing a sequence of actions to check possible causes of problems;
- using reference manuals to guide in the procedures to check each possible cause; and
- isolating the problem to a specific reason or cause.

Firms indicated that employees at all three occupational levels must be capable of collecting information for use in trouble shooting and problem solving. The techniques identified include asking probing questions, assessing situations using the five senses and using test instruments and tools. The ability to ask probing questions is more common to the skilled and para-professional levels.

Regional Data Analysis

The regional data for this section of the survey reflects in general, the provincial with a number of exceptions. The exceptions are listed below by occupational level.

Semiskilled Level

For the majority of firms, employees . . .

- West: ... are not required to give job related instructions or directions. Generally this skill is less important for all regions than giving information or asking job-related questions.

- Central and West: ... are not required to take part in formal meetings, collect information for use in troubleshooting nor problem solving.

- East and North: ... are required to negotiate with fellow workers and/or customers, list, state or think of possible reasons which might cause certain faults or symptoms as part of a diagnostic or problem solving process.

Skilled Level

- West: The majority of firms indicated that skilled level employees are not required to make presentations to groups.

Paraprofessional Level

- All regional data corresponded with the provincial results, with no exceptions being identified.

Sectorial Data Analysis

Semiskilled Level

For the majority of firms, employees . . .

- Manufacturing: ... are not required to dialogue with supervisors, take part in formal meetings nor use tools and/or instruments in troubleshooting problems.
- Natural Resources: ... are required to use diagnostic skills to identify possible reasons for a problem, symptom or fault.
- Construction: ... are not required to give job directions/instructions or take part in formal meetings. They are required to use diagnostic skills to identify possible reasons for a problem, symptom or fault.
- Transportation, Health Care and Wholesale/Retail: ... are required to negotiate with fellow workers and/or customers and use diagnostic skills to identify possible reasons for a problem, symptom or fault.
- Service: ... are required to negotiate with fellow workers and/or customers.
- Finance: ... are not required to give job directions/ instructions, take part in formal meetings or isolate problems by asking probing questions using the five senses and/or using instruments or tools.
- Education/Government: ... are not required to give job directions/instructions, dialogue with supervisors or take part in formal meetings. In addition, they are not required to isolate problems by asking probing questions using the five senses and/or using instruments or tools.

Skilled Level

For the majority of firms, employees . . .

- Transportation: ... are not required to make presentations.

- Finance: ... are not required to make presentations nor isolate problems by using tools or instruments.

- Education/Government: ... are not required to make presentations and isolate problems by asking probing questions using the five senses or using tools or instruments.

  Manufacturing, Natural Resources, Construction, Service, Health Care and Wholesale/Retail: Sectorial results match the provincial results. However, more positions in manufacturing and natural resources require the variety of problem solving/diagnostic skills.

Paraprofessional Level

- Manufacturing, Natural Resources, Construction, Transportation, Service, Health Care, Wholesale/Retail, Finance, Education/Government: Paraprofessional sector results directly match the provincial results.

MATHEMATICS

Provincial Data Analysis

The majority of semiskilled positions in Ontario require a very limited set of numeracy skills. Specifically, employees at this level are required to make calculations using whole numbers and decimals as they relate to money, to recognize geometric shapes, to estimate time and weight, to measure time, to use metric and imperial units of measure and to read scales and meters. In addition, some semiskilled positions require individuals to make calculations using fractions, decimals and percentages, to recognize common angles, to estimate distance, area and liquid volume, to measure weight, distance and liquid volume and to convert imperial measurements to metric or the reverse.

The skilled and paraprofessionals require very similar numeracy skill-sets to function on the job. The following list of competencies are associated with the majority of firms that employ these individuals:

- make calculations using whole numbers, fractions, decimals and percentages;
- interconvert fractions, decimals and percentages;
- recognize and draw geometric shapes and common angles;
- interpret drawings and blue prints;
- interpret graphs;
- estimate time, weight, distance and area;
- measure time, weight and distance;
- use metric and imperial measurement;
- convert measurements from metric to imperial and the reverse;
- read scales and meters;
- solve word problems;
- calculate ratios;
- solve problems using proportions; and
- calculate areas, perimeters and volumes.

In addition, the majority of the skilled require the ability to estimate volume. The majority of paraprofessionals also require the ability to produce and record information on graphs, to draw objects to scale and to take measurements from scale drawings.

A number of other numeracy skills are identified for skilled and paraprofessionals by thirty to forty-nine percent of the firms surveyed. For the skilled level the following numeracy skills were identified:

- taking measurements from scale drawings;
- drawing objects to scale;
- estimating liquid volume;
- measuring liquid volume; and
- solving problems algebraically at the one variable level.

For the paraprofessional level, the following numeracy skills were identified:

- estimating liquid and spatial volume;
- measuring liquid volume;
- solving problems algebraically at the one variable level;
- performing geometric calculations; and
- performing trigonometric calculations.

Regional Data Analysis

On the whole, regional data for numeracy skills matches the results for the province. However, there are numerous small variations from region to region. These variations are noted for each of the occupational levels.

Semiskilled Level

For the majority of firms, employees . . .

- North: ... are required to perform calculations using decimals, including adding, subtracting, multiplying, dividing and rounding off decimals. They also require skills in converting imperial measurements to metric and vice versa. They are not required to recognize geometric shapes.

- West: ... do not require skills in using units of metric measurement, converting imperial or metric measurements, reading scales and meters, making estimates regarding time and weight.

- Central and West: ... do not require skills on the job for the use of decimals as they relate to money. Less than one third of the firms indicated that employees required skills in estimating area and liquid volume.

East and North: More than one third of the firms indicated that employees required skills in estimating area and liquid volume.

Skilled Employees

For the majority of firms, employees . . .

- West: ... do not require the use of decimals with respect to dollars and cents as a component of their job. They do not require numeracy skills relating to calculations using ratios and/or proportion nor do they solve arithmetic word problems. They also do not require skills in estimating and measuring liquid volumes.

- East: ... do not require skills in estimating distance.

- North: ... are required to draw objects to scale, solve problems algebraically at the one variable level.

  Employees in more than thirty percent of firms require skills in trigonometry, geometry and the solving of two variable algebraic problems.

- West: ... do not require skills in estimating or measuring liquid volumes, numeracy skills relating to calculations using ratios and/or proportion or to solve arithmetic word problems.

- Central and North: ... are required to take measurements from scale drawings, and to produce and record information on graphs.

- East and West: ... do not require skills for interconverting fractions, decimals and percentages, to interpret graphs, nor in estimating spatial volumes.

- Central: More than thirty-three percent of firms indicated that employees solve problems algebraically at the one variable level.

Paraprofessional Level

For the majority of firms, employees . . .

- Central: ... are required to estimate spatial volumes.

- East: ... do not require the ability to measure distance or recognize common angles, draw or sketch geometric shapes, read scale drawings or blueprints, assembly drawings and schematics, take measurements from scale drawing, draw graphs, solve problems using proportions, calculate areas, perimeters and volumes. The ability to perform trigonometric and geometric calculations is required by less than thirty percent of firms.

- North: ... do not require the ability to interpret assembly drawings and schematics.

- West: ... do not require the ability to take measurements from scale drawings, to draw to scale, record information on graphs, draw graphs, measure weight, solve arithmetic word problems, nor estimate area.

- Central, East and North: ... are required to estimate liquid volume.

- East and West: ... do not require the ability to solve problems algebraically at the one variable level.

  Central and North: More than thirty percent of firms indicated that paraprofessionals must solve two variable algebraic calculations.

Sectorial Data Analysis

Semiskilled Level

For the majority of firms, employees . . .

- Manufacturing: ... do not require skills in using decimals in relation to money or estimating time and weight. Less than thirty percent of employees require skills in multiplying, dividing and rounding off decimals, making calculations using percentages, estimating area and liquid volume and converting imperial and metric measures. However, the majority required skills in recognizing common angles.

- Natural Resources: ... require skills in multiplying and dividing fractions, adding, subtracting, multiplying, dividing and rounding off decimals, calculating the percent of a number, estimating distance and area and measuring distance, weight and liquid volume. More than thirty percent of firms require skills in solving arithmetic word problems.

- Construction: ... require skills in adding and subtracting fractions and adding, subtracting, multiplying and dividing decimals. They do not require skills in using decimals in relation to money. Less than thirty percent of employees require skills in making calculations using percent, recognizing common angles, estimating liquid volume, measuring weight, converting imperial measurement to metric and vice versa and reading scales and meters.

- Transportation: ... are required to add, subtract and round off decimals, estimate distance and spatial volume and convert imperial measures to metric and vice verse. More than thirty percent of the firms require employees to change decimals to percentages or vice versa. Less than thirty percent of firms require employees to recognize common angles.

- Service: ... do not require employees to estimate weight and time or read scales and meters. Less than thirty percent of firms indicated that employees require skills in making calculations related to fractions, decimals and percents and in recognizing common angles and in measuring distance.

- Health Care: ... require skills in estimating weight and liquid volume, measuring weight, distance and liquid volume. Less than thirty percent of firms required employees to round off decimals, make calculations using percentages and recognize common angles.

- Wholesale/Retail: ... require skills in making calculations using fractions and decimals, calculating the percent of a number, converting imperial measurements to metric and vice versa. More than thirty percent of employees are required to recognize geometric shapes and solve arithmetic word problems. Less than thirty percent are required to recognize common angles, estimate or measure distance and liquid volume.

- Finance: ... require skills in performing calculations with fractions and decimals. More than thirty percent of employees determine equivalents for fractions, decimals or percents and interpret or draw graphs. Less than fifty percent are required to recognize geometric shapes or use imperial measures and less than thirty percent are required to estimate or measure distance, weight, area and liquid volume or read meters and scales.

- Education/Government: Less than fifty percent of employees require skills in using decimals in relation to money. More than thirty percent are required to draw or sketch geometric shapes, solve arithmetic word problems and a majority are required to measure weight.

Skilled Level

For the majority of firms, employees . . .

- Manufacturing: ... are required to take measurements from scale drawings, record information on graphs and draw graphs. Less than fifty percent of employees are required to solve arithmetic word problems. Thirty to forty-nine percent of employees are required to perform geometric calculations.

- Natural Resources: ... are required to take measurements for scale drawings, draw to scale, record information on graphs and draw graphs, estimate and measure liquid volume and solve problems algebraically at the one variable level. Thirty to forty-nine percent of employees perform geometric and trigonometric calculations and solve two variable algebraic problems.

- Construction: ... are required to estimate liquid volume. Less than fifty percent of employees are required to solve arithmetic word problems or interpret graphs. Thirty to forty-nine percent are required to perform geometric calculations.

- Transportation: ... are required to estimate and measure liquid volume. Less than fifty percent of firms required employees to read scale drawings and blueprints, interpret graphs, solve arithmetic word problems, make calculations using ratio and proportion and calculate areas, perimeters and volumes. Thirty to forty-nine percent of employees are required to perform geometric calculations.

- Service: ... are required to estimate and measure liquid volume. Thirty to forty-nine percent perform geometric calculations and solve two variable algebraic problems. Less than fifty percent of firms required employees to recognize common angles and draw geometric shapes.

- Health Care: ... are required to estimate and measure liquid volume. Less than fifty percent of firms require employees to interpret assembly drawings and blue prints, interpret graphs, make calculations using ratio and proportions and calculate areas, perimeters and volumes.

- Wholesale/Retail: Less than fifty percent of firms require employees to recognize and draw geometric shapes and common angles, interpret drawings, blueprints and schematics, interpret graphs, estimate and measure distance, area and volume, measure weight, solve arithmetic word problems, make calculations using ratios and calculate areas, perimeters and volumes. Less than thirty percent of employees are required to solve one variable algebraic problems.

- Finance: Less than thirty percent of firms require employees to recognize and draw geometric shapes and common angles, interpret drawings, blueprints and schematics, take measurements from drawings and draw to scale, estimate and measure weight, distance, area and volume, calculate areas, perimeters and volumes and solve problems using proportions and algebra at a one variable level. Thirty to forty-nine percent of employees interpret, draw and record information on graphs, convert imperial and metric measurements, read scales and meters, solve word problems and make calculations using ratios.

- Education/Government: ... are required to take measurements from scale drawings and draw to scale, draw and record information on graphs. Thirty to forty-nine percent of employees calculate areas, perimeters and volumes. Less than thirty percent are required to solve one variable algebraic problems.

Paraprofessional Level

For thirty to forty-nine percent of the firms, employees . .

- Manufacturing: ... are required to draw to scale, produce graphs and solve arithmetic and word problems. Less than thirty percent are required to perform geometric and trigonometric calculations.
- Transportation: ... are required to recognize common angles, draw geometric shapes and common angles, interpret drawings and blueprints, draw to scale and estimate weight, area and volume. Less than thirty percent of employees measure liquid volume and perform geometric and trigonometric calculations.
- Service: ... are required to recognize and draw common angles, interpret scale drawings and blueprints, take measurements from scale drawings, draw to scale, measure weight and distance and solve problems using two variable algebraic calculations. Less than thirty percent of employees perform trigonometric calculations.
- Health Care: ... are required to interpret drawings, blueprints and schematics, take measurements from drawings, draw to scale and produce graphs. Less than thirty percent of employees are required to perform geometric and trigonometric calculations.
- Wholesale/Retail: ... are required to recognize and draw geometric shapes and common angles, interpret drawings, blueprints and schematics, take measurements from scale drawings, draw to scale, estimate and measure weight, distance, area and volume and calculate areas, perimeters and volumes. Less than thirty percent of employees are required to solve problems involving one variable algebraic, geometric and trigonometric calculations.

- Finance: ... are required to recognize and draw geometric shapes and common angles, interpret drawings, blueprints and schematics, take measurements from scale drawings, estimate distance and area, measure weight and distance, calculate area, perimeter and volume and solve problems involving two variable algebraic calculations. Less than thirty percent of employees are required to estimate and measure liquid volumes and perform geometric and trigonometric calculations.
- Education/Government: ... are required to estimate weight, liquid volume and spatial volume and measure weight, distance and liquid volume. The majority of employees are required to solve problems using one and two variable algebraic, geometric and trigonometric calculations.
- Natural Resources and Construction: The majority of firms indicated that employees are required to solve problems involving one variable algebraic, geometric or trigonometric calculations. Thirty to forty-nine percent solve problems using two variable algebraic calculations.

SCIENCE

Provincial

In the Science section of the survey, the questions reflected the content presented to Ontario students enrolled in a Basic Training for Skill Development Program[4]. The content was divided into four subject areas: general science, biology, chemistry and physics. The information collected attempted to determine the extent of science knowledge required in the work setting by employees at each of the three occupational levels.

The province-wide results indicate that the topics in science education have very limited direct application to functions at any of the three occupational levels.

For semiskilled workers, no topics in science were required. For the skilled and paraprofessionals, some requirement for topics in general science, chemistry and physics were identified by employers.

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[4] Basic Training for Skills Development (BTSD) is a federally-sponsored academic upgrading program.

GENERAL SCIENCE

For thirty to forty-nine percent of positions at the skilled and paraprofessional level, firms indicated that all topics identified in general science were relevant to the work place. For skilled workers, in particular, the majority of employers required knowledge of the basic terms, processes and properties of water and electricity.

BIOLOGY

Employers indicated relatively no need, for any level of employee, for background in biology as directly applicable to the work place.

CHEMISTRY

For thirty to forty-nine percent of employers, skilled and paraprofessional positions required a knowledge of basic terminology, symbols, rules, laws and theories related to acids and bases. The same degree of knowledge is required for gases and solutions.

PHYSICS

For thirty to forty-nine percent of employers, the skilled and paraprofessional required knowledge of kinematics dynamics, heat and AC/DC electricity. In addition skilled positions required knowledge of electronics.

Regional

Region by region results for science content reflect the provincial results. Interestingly, the northern region indicates that more science knowledge is generally required in this region than others, while the eastern region indicates a lower requirement. The semiskilled level had no requirement for science knowledge in any of the four subject areas. The following variations were noted for the skilled and paraprofessionals in each of the four subject areas.

GENERAL SCIENCE

Skilled Level

For the majority of firms, employees . . .

- Central: ... require a knowledge of levers and electricity.
- North: ... require a knowledge of properties of water, density, levers and electricity.

- West: ... require a knowledge of properties of water and levers.

Paraprofessional Level

- East: Less than thirty percent of firms indicated that paraprofessional level employees required knowledge of density, levers and static electricity.
- North and Central: The majority of firms indicated that paraprofessionals required knowledge of electricity.

BIOLOGY

Only at the paraprofessional level was there a need for knowledge of concepts relating to biology. However, only two topic areas were identified.

- East: More than thirty percent of paraprofessional required knowledge of the chemistry of life.
- Central: More than thirty percent of paraprofessional level employees required a knowledge of ecology.

CHEMISTRY

Skilled Level

- East: No chemistry knowledge is required for skilled level employees.
- North: More than thirty percent of firms require skilled level employees to have a knowledge of solutions.
- West: More than thirty percent of firms require skilled level employees to have a knowledge of gases and solutions but not of acids and bases.

Paraprofessional Level

- Central: More than thirty percent of firms require paraprofessional level employees have a knowledge of chemical bonding.
- East: No chemistry knowledge is required for paraprofessionals.

- North: Less than thirty percent of firms require paraprofessionals to have a knowledge of solutions and of acids and bases.

- West: Less than thirty percent of firms require paraprofessionals to have a knowledge of gases and of acids and bases.

PHYSICS

Skilled Level

For more than thirty percent of firms, employees required knowledge of . . .

- Central: ... physics in only two topic areas: force and AC/DC electricity.

- East: ... physics in only one topic area: heat.

- North: ... wave motion and electromagnetic induction in addition to the topics identified in the provincial results.

- West: ... electromagnetic induction in addition to the topics identified in the provincial results. However, electronics was required by less than thirty percent of employees.

Paraprofessional Level

For more than thirty percent of firms, employees . . .

- West: ... required electromagnetic induction in addition to the topics identified in the provincial results.

- Central and North: ... required electronics in addition to the topics identified in the provincial results.

- East: No physics knowledge is required for paraprofessional level employees.

Sectorial Data Analysis

GENERAL SCIENCE

Semiskilled Level

In all sectors, and for the majority of firms, most semiskilled workers do not require general science topics. In manufacturing, natural resources, construction, health care and education/government, some topics were identified by thirty to forty-nine percent of firms. In transportation, service, wholesale/retail and finance, no science topics were required.

Requirements . . .

- Health Care and Education/Government: The topic dealing with basic terms, processes and properties of water.
- Natural Resources, Manufacturing and Construction: Knowledge of terms, processes and properties of electricity.
- Natural Resources: Knowledge of static electricity and water.
- Manufacturing: Knowledge of levers.
- Construction: Knowledge of levers, density, mater and water.

Skilled Level

In manufacturing, natural resources, construction and health care, the majority of firms required skilled employees to have knowledge of general science topics. In transportation, service, wholesale/retail and education/ government, thirty to forty-nine percent required knowledge of these topics and in the financial sector less than thirty percent.

For the majority of firms, employees . . .

- Manufacturing, Natural Resources, Construction, Service, Health Care and Eduction/Government: ... required a knowledge of electricity.
- Manufacturing, Natural Resources and Health Care: ... required a knowledge of static electricity and water.

- Natural Resources, Construction and Health Care: ... required a knowledge of water, matter and density.
- Transportation, Service and Education/Government: More than thirty percent of firms indicated that employees required a knowledge of all general topics.

Paraprofessional Level

The paraprofessional level requires less general science knowledge than does the skilled level. Only in natural resources and construction did the majority of firms require employees to have a knowledge of general science topics. In service, transportation, health care and manufacturing, thirty to forty-nine percent of firms indicated that paraprofessionals required knowledge of all general science topics.

- Finance: Less than thirty percent of firms required employees to have a knowledge of general science topics.
- Wholesale/Retail: Thirty to forty-nine percent of firms indicated that employees required a knowledge of electricity.

For the majority of firms, employees required . . .

- Manufacturing: ... a knowledge of density.
- Transportation: ... a knowledge of levers.
- Health Care: ... a knowledge of water.

BIOLOGY

In manufacturing, natural resources, construction, transportation, service, wholesale/retail, finance and education/government, none of the topics associated with biology are required by the semiskilled or skilled. In construction and transportation, thirty to forty-nine percent of firms required paraprofessionals to have a knowledge of ecology. In education/ government, thirty to forty-nine percent of firms required a knowledge of human biology. In health care, firms indicated that both skilled and paraprofessionals required knowledge of biology.

In health care, thirty to forty-nine percent of firms required skilled employees to have knowledge of all biology topics except bio energetics. Similarly, for paraprofessionals in health care, thirty to forty-nine percent of firms indicated this level of employee required all topics in biology, with a majority indicating that the chemistry of life was also required.

CHEMISTRY

Knowledge of the basic terms, symbols, rules, laws and theories related to chemistry is required primarily by individuals employed in manufacturing, natural resources and health care. Firms in transportation and construction indicated a requirement for a limited knowledge of some of the topic areas in chemistry. The remaining sectors did not require background in chemistry. In general, the skilled level required a greater application of physics knowledge than the paraprofessional level.

Semiskilled Level

- In all sectors, firms indicated that semiskilled employees are not required to have knowledge of chemistry.

Skilled Level

For thirty to forty-nine percent of firms, employees...

- Manufacturing, Natural resources, Construction, Transportation and Service: ... required a knowledge of acids and bases. In Health Care, the majority required this knowledge.
- Manufacturing, Natural Resources, Construction and Transportation: ... required a knowledge of solutions. In Health Care, the majority required this knowledge.
- Manufacturing, Natural Resources, Transportation and Health Care: ... required a knowledge of gases.
- Natural Resources: ... required a knowledge of water.
- Construction: ... required knowledge of chemical bonding.

Paraprofessional Level

For thirty to forty-nine percent of firms, employees...

- Manufacturing and Health Care: ... required a knowledge in all topic areas.
- Natural Resources: ... required a knowledge of matter, atomic structure, periodic law and chemical bonding.
- Construction: ... required a knowledge of periodic law, gases, solutions and acids and bases.
- Service: ... required a knowledge of gases and acids and bases.
- Education/Government: ... required a knowledge of solutions.
- Transportation, Wholesale/Retail and Finance: There was no requirement for chemistry for the paraprofessional.
- Manufacturing, Natural Resources and Health Care: The majority of firms required a knowledge of some topics in chemistry by paraprofessionals. In manufacturing, these topics were solutions and acids and bases; in natural resources, gases and solutions and in health care, acids and bases, and formulae and nomenclature.

PHYSICS

Knowledge of basic concepts and laws associated with physics is required primarily by individuals employed in manufacturing, natural resources, construction and health care. Firms in transportation and service have a requirement for some of the topics associated with physics. Wholesale/retail, finance and education/government have virtually no requirement for knowledge of physics.

Semiskilled Level

Only natural resources and construction indicated that employees at this level required a knowledge of physics. In natural resources, thirty to forty-nine percent of firms indicated that employees required a knowledge of AC/DC electricity. A knowledge of heat and work, energy and power were required by thirty to forty-nine percent of firms in construction.

Skilled Level

For thirty to forty-nine percent of firms, employees...

- Health Care: ... required a knowledge of all topics except nuclear energy.
- Manufacturing and Construction: ... required a knowledge of kinematics, dynamics, heat, AC/DC electricity and electromagnetic induction.
- Service: ... required a knowledge of kinematics, dynamics, heat, AC/DC electricity and electronics.
- Transportation: ... required a knowledge of motion, force, heat and AC/DC electricity.
- Wholesale/Retail and Education/Government: ... required a knowledge of AC/DC electricity and electronics.
- Natural Resources: The majority of firms required a knowledge of all topics except nuclear energy.
- Finance: No need indicated.

Paraprofessional Level

For the majority of firms, employees . . .

- Natural Resources: ... required all topics in physics except wave motion and nuclear energy.
- Health Care: ... required a knowledge of heat. In addition, thirty to forty-nine percent of firms indicated that all other topics in physics were required by their employees.
- Construction: ... required a knowledge of force, heat and work and power and energy. Thirty to forty-nine percent of firms required knowledge of motion and AC/DC electricity.
- Manufacturing: Knowledge of all topics in physics except nuclear energy was required by thirty to forty-nine percent of firms.
- Transportation and Education/Government: Knowledge of AC/DC electricity was required by thirty to forty-nine percent of firms.

- Service: Knowledge of work energy and power, AC/DC electricity and electronics was required by thirty to forty-nine percent of firms.
- Wholesale/Retail and Finance: No need indicated.

COMPUTER LITERACY

Provincial Data Analysis

The majority of semiskilled workers in Ontario are not involved in using computers in the work place. Skilled and paraprofessional positions required use of computers for clerical and financial functions, data collection and analysis and inventory analysis.

Eighty-seven percent of employers indicated that, for the paraprofessional, computer literacy is either essential or advantageous on job entry. For the skilled level, seventy-nine per cent of employers indicated that computer literacy would be advantageous or essential.

Regional Data Analysis

In no region does the majority of semiskilled level employees use the computer in any capacity.

The data for skilled and paraprofessionals for northern and central regions reflect the provincial results. Eastern and western regions currently tend to have less requirement for the use of computers at the skilled and paraprofessional levels. The variations between regions are noted for the skilled and the paraprofessional.

Skilled Level

- East: Less than fifty percent of firms required employees to use computers for inventory analysis.
- North: The majority of firms required skilled level employees use computers for operational planning, budgeting and forecasting.
- West: Less than fifty percent of firms required employees to use the computer in any capacity.
- In all regions, firms indicated that it would be advantageous or essential for skilled level employees to possess some degree of computer literacy.

Paraprofessional Level

For the majority of firms, employees . . .

- West: ... use the computer to perform only clerical functions.
- North and Central: ... use the computer for operational planning, budgeting and forecasting.
- East: Less than forty percent of firms indicated that employees use the computer in any capacity.
- In all regions, firms indicated that it would be advantageous or essential for the paraprofessional to possess some degree of computer literacy.

Sectorial Data Analysis

The majority of firms indicated that skilled and paraprofessional employees are required to use computers on the job in the following sectors: manufacturing, transportation, service, wholesale/retail, finance and education/government. In natural resources and health care, the majority indicated that only skilled workers are presently using computers and in construction, computers are not presently used at any level. In all sectors where computers are used they perform clerical, financial and data collection and analysis, and inventory control activities. In manufacturing, transportation, wholesale/retail, education/government and health care, computers are used for operational planning, budgeting and forecasting.

All nine sectors indicated some degree of computer literacy was essential or advantageous for new employees at the skilled or paraprofessional level. The majority of firms in natural resources and wholesale/retail indicated that computer literacy was essential or advantageous also for semiskilled employees.

WORK ADJUSTMENT SKILLS

Provincial Data Analysis

Work adjustment skills refer to those attitudes, interpersonal skills and personal behaviours that impact on successful job performance.

For all three occupational levels, employers emphasized the need for strong work adjustment skills, particularly in the areas of developing interpersonal relationships, showing initiative, following schedules, following instructions, managing time, adapting to change, demonstrating personal motivation, developing positive communication techniques and demonstrating positive attitudes toward work.

The majority of employers indicated that knowledge of safety-related issues and legal documents was important for all levels. In addition, basic legal rights and responsibilities, first aid and provisions of the Worker's Compensation Act were relevant to most positions in the three occupational levels.

Employers identified the same seven topics as important for more than eighty percent of employees at all occupational levels. These topics included:

- care of equipment and materials
- substance abuse
- personal hygiene
- human rights
- responding to change
- performance review
- worker satisfaction

Other topics identified by the majority of employers as important for all three levels included:

- stress management
- community resources
- stereotyping
- nutrition

Regional Data Analysis

Across the regions, firms indicated that strong work adjustment skills were required for all levels of employees. Regional data matches provincial results. Some variations in the knowledge required and the importance of topics related to work adjustment skills were identified by region although these differences were few in number. The following variations are noted by occupational level.

Semiskilled

Less than fifty percent of firms indicated that employees require . . .

- Central: ... knowledge of the Worker's Compensation Act.

- East: ... knowledge of the Occupational Health and Safety Act.
- North: ... a knowledge of first aid.
- West: Firms indicated that it was important for less than fifty percent of employees to be aware of community resources and stress management.

Skilled

- West: Awareness of community resources was important for less than fifty percent of employees.
- North: More of the skilled level positions required knowledge of the Occupational Health and Safety Act and basic legal rights and responsibilities on the job.

Paraprofessional

- West: Less than fifty percent of firms indicated that employees required knowledge of first aid.
- North: Fewer paraprofessionals required knowledge of standard safe work practices.
- Central and West: More paraprofessionals required knowledge of basic legal rights and responsibilities of the job.

Sectorial Data Analysis

In all nine sectors the majority of firms indicated that work adjustment skills and attitudes were required by all three levels of employees.

Semiskilled Level

A greater percentage of the service and wholesale/retail sectors required time management, decision making and advancement-related skills.

Skills required to advance on the job were of importance to a smaller percentage of firms in health care and education/ government. In manufacturing, natural resources, health care and education/ government, time management skills were identified less often. In finance, the majority of firms interviewed did not require knowledge of the Occupational Health and Safety Act nor the Worker's Compensation Act. The majority of employers in education/government did not require a knowledge of the Worker's Compensation Act.

Skilled and Paraprofessional Levels

In all sectors, greater than fifty percent of firms indicated that strong work adjustment skills and attitudes were required for both skilled and paraprofessional employees. In finance, the majority indicated that knowledge of the Worker's compensation Act and the Occupational Health and Safety Act was not required by skilled or paraprofessional employees.

TECHNICAL HANDS-ON

Provincial Data Analysis

Survey results indicate that the technical hands-on component of the OBS/FBO program would be most applicable to trainees intending to pursue careers at the semiskilled or skilled occupational level. The majority of these positions require the use of a variety of hand tools. As well, skilled workers require basic experience in the operation of portable hand power tools and measuring devices. The paraprofessional would require some experience in basic measuring devices only.

Regional Data Analysis

The data by region for technical hands-on requirements is quite variable. In general, the east has identified very limited requirement for hands-on skills at all three occupational levels whereas the north indicated a high level of skill for both semiskilled and skilled. Each of the regions, however, supports that the majority of paraprofessionals require only some experience in basic measuring devices. For each of the regions the following variations were noted for the semiskilled and skilled.

HAND TOOLS

Semiskilled Level

For the majority of firms, employees . . .

- Central: ... require some basic experience in using hammers, pliers, screwdrivers and wrenches.
- North: ... require some basic experience in using all basic hand tools identified in the survey.
- West: ... require some basic experience in using screwdrivers.

- East: There is no hand tools use requirement for a majority of semiskilled workers.

Skilled Level

For the majority of firms, employees . . .

- East: ... require some basic experience in using hammers and screwdrivers.
- Central, North and West: ... require some basic experience in using all basic hand tools identified in the survey.

PORTABLE POWER TOOLS

Semiskilled Level

- For all regions, there is no requirement for portable hand tool use for the majority of semiskilled employees.

Skilled Level

- Central, North and West: The majority of firms indicated that skilled level employees required some basic experience in operating drills, grinders and oxyacetylene welders. In addition circular saws and sanders were common to two of the three regions.
- East: There was no requirement for portable hand tool for a majority of skilled level employees.

FIXED POWER TOOLS

Semiskilled Level

- For all regions, there is no requirement for fixed power tool use for a majority of semiskilled workers.

Skilled Level

For the majority of firms, employees . . .

- Central: ... require some basic experience in operating drill presses.
- West: ... require some basic experience in operating arc welding equipment and drill presses.

- East and North: There is no requirement for fixed power tools to be used by a majority of skilled level employees.

MEASURING INSTRUMENT

Semiskilled Level

- Central and North: The majority of firms indicated that semiskilled employees require some basic experience is the use of measuring tapes. The northern region requires also the use of rulers.

- East and West: There is no requirement for the majority of semiskilled employees to use measuring devices.

Skilled Level

For the majority of firms, employees . . .

- Central, North and West: ... require some basic experience in using all measuring devices identified in the survey.

- East: ... require some basic experience in the use of rulers and tapes.

LABORATORY EQUIPMENT

There was no requirement in any region for some basic experience in use of laboratory equipment for a majority of employees at any of the three occupational levels.

Sectorial Data Analysis

Equipment and tools were identified primarily by the following sectors: manufacturing, natural resources, construction, trans- portation, health care and education/government. In these sectors the equipment and tools were preimarily used by skilled level employees.

HAND TOOLS

Semiskilled Level

For the majority of firms, employees . . .

- Construction and Natural Resources: ... used all the listed hand tools.

- Manufacturing: ... used all the listed hand tools except levels, planes, ratchets, saws, soldering tools and squares.

- Transportation, Service and Education/Government: ... used a small number of tools, the most common being hammers, pliers and screwdrivers.

- Health Care, Wholesale/Retail and Financial: No hand tools were identified for semiskilled employees.

Skilled Employees

For the majority of firms, employees . . .

- Manufacturing, Natural Resources, Construction, Health Care and Education/Government: ... used all the listed hand tools.

- Transportation: ... used all the listed hand tools with the exception of planes.

- Service and Wholesale/Retail: ... used only a few of the listed hand tools.

- Finance: used no hand tools listed.

Paraprofessional Level

- Only in natural resources were paraprofessionals using hand tools.

- The majority of employers in natural resources indicated that employees used all the listed hand tools except brace and bit and planes.

PORTABLE HAND POWER TOOLS

Semiskilled Level

For the majority of firms, employees . . .

- Natural Resources and Construction: ... used portable power tools on the job.

- Construction: ... used all the listed portable power tools except oxyacetylene welders.

- Natural Resources: ... used only circular saws and as the only portable power.

Skilled Level

For the majority of firms, employees . . .

- Manufacturing, Natural Resources, Construction and Education/Government: ... used all the listed portable hand power tools.

- Transportation and Health Care: ... used most portable hand power tools with the exception in transportation of saber saws and circular saws, and in health care the saber saws and oxyacetylene welders.

- Finance, Wholesale/Retail and Service: No portable hand power tools were identified.

Paraprofessional Level

- In no sector did the majority of firms indicate that paraprofessionals used portable hand power tools.

FIXED POWER TOOLS

The majority of firms indicated that only skilled employees used fixed power tools. Manufacturing and education/ government required the greatest diversity of fixed power tool usage.

For the majority of firms, employees . . .

- Manufacturing: ... used all fixed power tools, except jointers.

- Education/Government: ... used all fixed power tools except routers, MIG/TIG welders and arc welders.

- Natural Resources and Transportation: ... used arc welders and drill presses.

- Construction: ... used arc welding and table saws.

- Service, Health Care, Wholesale/Retail and Financial: No fixed power tools were identified.

MEASURING DEVICES

Semiskilled Level

The majority of firms in manufacturing, natural resources, construction, transportation and health care required the use of measuring devices by semiskilled personnel.

For the majority of firms, employees . . .

- Five Sectors: ... used rulers and tapes for the most common measuring device.

- Natural Resources: ... used electronic gauges.

- Construction: ... used squares as the most common measuring device.

Skilled Level

The majority of firms in manufacturing, natural resources, construction, transportation, service, health care, wholesale/retail and education/government required the use of some measuring devices by skilled employees.

For the majority of firms, employees . . .

- Manufacturing and Education/Government: ... used all the listed measuring devices.

- Natural Resources and Construction: ... used all the measuring devices with the exception of micrometers.

- Transportation: ... used all the listed measuring devices with the exception of protractors.

- Health Care: ... used all measuring devices with the exception of micrometers, protractors and squares.

- Service and Wholesale/Retail: ... used only rulers and tapes for measuring devices.

- Finance: did not use any of the measuring devices.

Paraprofessional Level

The majority of firms in the natural resources, construc- tion, health care and education/government sectors required the use of some measuring devices by paraprofessionals.

For the majority of firms, employees . . .

- Natural Resources: ... used calipers, electronic gauges, mechanical gauges, protractors, rulers and tapes.
- Construction: ... used protractors, rules, squares and tapes.
- Health Care and Education/Government: ... used only rulers and tapes.

CHAPTER 5.

COLLEGE CONSOLIDATION PHASE

5.1 BACKGROUND

COLLEGE CONSOLIDATION (PHASE II) INTO LEARNING OBJECTIVES

Objective

The college consolidation phase was designed to offer all colleges an opportunity to provide input on the terminal performance and enabling objectives for OBS/FBO. College faculty were to design objectives that reflected the competencies derived from the industrial survey as well as each colleges' specific curriculum and the entry level prerequisites for post secondary and skills training programs.

Methodology

Each of the twenty-two colleges was requested to identify an individual faculty member from the OBS program to attend a five day objective-development workshop. These faculty members were representative of the six subject areas, namely: communications, mathematics, science, computer literacy, technical hands-on and work adjustment skills. In addition, within each subject area there were representatives from the basic, intermediate and advanced levels of the OBS program.

On the initial day of the workshop, the rationale for the project and the preliminary results of the industrial survey were discussed. Guidelines and formats for the writing of objectives as well as a proposed approach for the remainder of the workshop were presented.

It was proposed that faculty develop terminal performance and enabling objectives using a spiral structure and consider the possibility of integrating subject areas so that the curriculum would be driven by skill acquisition rather than content.

Over the remaining four days, college faculty were organized into one of four work groups: communications, math/science, computer literacy and work adjustment/technical hands-on to prepare terminal performance objectives and enabling objectives. With the assistance of a facilitator, each group brainstormed the terminal performance objectives, developing consensus as they proceeded. The enabling objectives were then prepared to reflect basic, intermediate and advanced levels within the OBS program.

The consolidation phase for the FBO program involved faculty representation from the colleges delivering FBO, namely: Algonquin College, Cambrian College, Northern College, Sault College and St. Lawrence College. They met over a three day period using a similar approach to the OBS workshop.

Terminal performance and enabling objectives were developed for the French communication and work adjustment skills at the basic, intermediate and advanced levels. Leadership was provided by a francophone facilitator.

For both OBS and FBO, additional time was required to complete the process for the English and French communications component.

Results of College Consolidation Phase

The objectives developed during this phase reflect a continuum from basic literacy to the competencies required to enter post secondary education. They are divided into basic, intermediate and advanced in communications, mathematics and science.

In the work adjustment skills, technical hands-on skills and computer literacy subject areas the objectives were not organized into levels. The working groups felt that the same competencies were relevant to all levels and could be integrated more easily into the curriculum if they were not designated to one particular level. The following list illustrates the structure of the six subjects.

Communications	- Basic level - Intermediate level - Advanced level
Mathematics	- Basic core - Intermediate core - Intermediate - Technical - Intermediate - Business - Advanced core - Advanced - Technical - Advanced - Business
Science	- Basic core - Intermediate core - Advanced - Biology - Advanced - Chemistry - Advanced - Physics
Work Adjustment Skills	- Work Adjustment - Vocational Assessment - Job Search

Technical Hands-On Skills

Computer Literacy

The Case For an Integrated Curriculum

The concept of an integrated curriculum was discussed and strongly supported by the college faculty. It would generate more effective transfer of skills from one subject area to another and should reduce the time requirement in the program. For example, computer literacy, work adjustment skills and communications could be combined so that students would prepare resumes using computers and word processing software; they could develop the information processing skills of listening, speaking, writing, reading and problem solving through the work adjustment content. Similarly, the mathematics, science and technical hands-on skills could be integrated to provide skills in measurement, estimation, the interpretation of scale drawings and the fabrication of small objects using hand and power tools.

OBS/FBO Entry Level Student Population

Characteristics of the target population for the basic, intermediate and advanced level of OBS were explored, with the following conclusions:

1. Second language individuals
2. Educationally disadvantaged/deprived individuals including early leavers and high school drop outs
3. Learning disabled individuals
4. Physically disabled individuals
5. Individuals with barriers to learning such as substance abuse, severe trauma and behavioural problems
6. Recent high school graduates
7. Individuals in transition such as career changers/life changers
8. Post secondary referrals
9. Individuals requiring skills upgrading or retraining

Summary of Consolidation Phase

It is noted that this project generated an excitement on the part of the participants and a commitment to the development of a comprehensive literacy program that is integrated and based on occupational goals. It has also created an expectation that the Ministry of Skills Development will continue to move forward, committing itself to a plan for implementation which will facilitate further curriculum development. This will require the coordinated effort of college and Ministry of Skills Development personnel to bring together a number of initiatives. These include the product of this project, the annotated bibliography and the modification of program guidelines that provide direction for the future.

For the purpose of the report, the terminal performance objectives will be presented in the body of the report and the enabling objectives as an appendix. The French version of the report will reflect the FBO objectives and the English version, the OBS objectives.

5.2 TERMINAL PERFORMANCE OBJECTIVES

TERMINAL PERFORMANCE OBJECTIVES

BASIC COMMUNICATIONS

READING:

A. Demonstrate pre-reading skills.

B. Read, using decoding and encoding skills (word attack and phonics, predicting, contextual clues and personal experience).

C. Interpret symbols, signs, maps, floor plans, schedules and tables.

D. Determine key information from simple notes, messages, memos and simple instructions.

E. Identify main ideas in various written media (e.g. stories, articles, instructional leaflets and handbooks).

F. Distinguish between fact and opinion.

G. Determine the writer's purpose.

WRITING:

A. Demonstrate basic writing skills

B. Use correct mechanics.

C. Use correct structure and syntax.

D. Demonstrate understanding of the writing process.

SPEAKING AND LISTENING:

A. Demonstrate basic listening skills.

B. Ask and answer questions coherently and concisely.

C. Give and follow directions or instructions.

D. Present/evaluate a point of view or information effectively.

INTERMEDIATE LEVEL COMMUNICATIONS

READING:

A. Locate information for a specific purpose using a variety of sources such as telephone directories, industrial directories, catalogues, manuals, dictionaries, thesauruses and encyclopedias.

B. Recognize symbols and signs; interpret maps, floor plans, schedules, charts, tables and graphs.

C. Determine key information from notes, messages, memos, vouchers, invoices, claims, simple instructions, letters and short reports.

D. Identify main ideas and details in magazines, newspapers and related occupational articles.

E. Distinguish between fact and opinion and cause and effect, make inferences and determine writer's purpose and audience.

WRITING:

A. Demonstrate control of standard written English.

B. Demonstrate understanding of the writing process.

C. Apply writing skills and strategies.

SPEAKING AND LISTENING:

A. Ask and answer questions coherently and concisely.

B. Give and follow directions or instructions.

C. Present/evaluate a point of view or information effectively.

ADVANCED LEVEL COMMUNICATIONS

READING:

A. Locate information for specific research purposes using a full range of resources.

B. Interpret symbols, signs, maps, floor plans, charts, tables and graphs.

C. Determine facts, opinions and inferences from a wide variety of written material.

D. Evaluate the style and content of a variety of written materials.

WRITING:

A. Demonstrate control of standard written English.

B. Demonstrate understanding of the writing process.

C. Apply writing skills and strategies.

SPEAKING AND LISTENING:

A. Ask and answer questions coherently and concisely.

B. Give and follow directions or instructions.

C. Present/evaluate a point of view or information effectively.

BASIC MATHEMATICS CORE

A. Recognize, explain and apply the language of mathematics relevant to one's assessed needs and learning styles.

B. Apply the number system to the reading and writing of numbers. For whole numbers comprising up to seven digits:

C. Perform basic mathematics operations of addition, subtraction, multiplication and division of whole numbers.

D. Recognize a variety of common geometric shapes as they appear in the environment.

E. Perform basic fractional operations.

F. Describe the basic concepts associated with decimal fractions and apply that knowledge in various economic and occupational settings.

G. Apply percentages to various economic and occupational settings.

H. According to individual interests, apply learning strategies to one or more selected areas where mathematics is utilized in daily activities.

INTERMEDIATE MATH CORE

A. Review whole number operations.

B. Review fraction operations.

C. Perform decimal operations.

D. Perform basic metric (SI) operations.

E. Perform percent operations.

F. Perform signed number operations.

G. Perform exponent and scientific notation operations.

H. Read, explain and perform ratio and proportion operations and use ration and proportion to solve problems.

I. Perform algebraic operations.

J. Solve linear equations.

K. Solve algebraic word problems.

L. Manipulate formulae.

INTERMEDIATE BUSINESS MATH

A. Perform basic business mathematic operations.

INTERMEDIATE MATH TECHNICAL

A. Perform operations involving algebraic expressions.

B. Perform graphing in the Rectangular Coordinate System.

C. Solve systems of linear equations in two variables.

D. Perform basic mensuration operations in geometry.

E. Perform basic operations involving basic geometric concepts.

ADVANCED MATHEMATICS CORE

A. Perform operations described in the Intermediate Level Core Units.

B. Perform operations with radicals.

C. Solve quadratic equations.

D. Graph linear equations and inequalities.

E. Determine properties of linear equations.

F. Perform operations involving variation.

G. Solve systems of linear equations in two unknowns.

H. Algebraically solve systems of equations in three unknowns and/or determinants.

ADVANCED BUSINESS MATH

A. Perform business mathematical operations.

ADVANCED MATHEMATICS TECHNICAL

A. Perform the operations in the Intermediate Technical Mathematics Unit.

B. Perform operations and solve equations involving polynomials.

C. Graph simple conic sections.

D. Perform computations involving angles.

E. Calculate primary trigonometric ratios.

F. Calculate quadrant values.

G. Perform operations for oblique triangles.

H. Perform logarithmic operations.

I. Develop measurement computation skills.

BASIC SCIENCE

A. Recognize, understand and apply the metric system for measurement of length, capacity, volume, mass and area.

B. Demonstrate an adequate awareness and knowledge of maps and mapping as may be applied to daily activities.

C. Demonstrate a knowledge of some of the basic terms used in the study of nutrition, human anatomy and genetics.

D. Demonstrate a knowledge of some of the basic terms used in the study of botany.

E. Recognize and identify some of the basic terms used in the study of mechanics, electricity, magnetism, power, nuclear power and energy.

F. Demonstrate a knowledge of basic environmental issues.

G. Demonstrate a knowledge of some of the basic terms used in the study of resources.

H. Demonstrate a knowledge of some of the basic terms used in the study of matter and atomic theory.

I. Demonstrate a knowledge of some of the basic terms used in the study of technology.

INTERMEDIATE SCIENCE CORE

A. Explain the concept of Science.

B. Explain what matter is.

C. Explain what an atom is.

D. Explain what water is.

E. Explain what solutions are and identify their characteristics.

F. Explain what acids and bases are and identify their characteristics.

G. With the aid of a microscope, explain what a cell is.

H. Explain the cell reproduction process.

I. Explain the concept of nutrition and how it affects our health.

J. Explain the digestion process in relation to the human body.

K. Explain the processes of photosynthesis and respiration.

L. Explain the human circulation and respiration processes.

M. Explain the concept of heat.

N. Explain the theory of light.

O. Explain sound theory.

P. Demonstrate a basic understand of the terminology and operation of simple machines.

Q. Explain density and gravity and their effects.

R. Understand current electricity and how it operates.

S. Explain the concept of static electricity.

T. Explain basic mechanical theory.

ADVANCED BIOLOGY

A. Explain the basics of life.

B. Explain the chemistry pertaining to life.

C. Explain cell form, function and energetics.

D. Explain the process and significance of cell replication.

E. Explain homeostasis and its significance in human physiology.

F. Describe the process of reproduction and its significance to the human species.

G. Explain genetics and its significance to human heredity.

CHEMISTRY ADVANCED

A. Perform basic mathematical operations.

B. Perform basic metric operations.

C. Explain the basic concepts of matter.

D. Explain the basic structure of the atom.

E. Describe the periodic classification of the elements.

F. Describe the characteristics of compounds.

G. Explain the nomenclature of inorganic compounds.

H. Perform chemical calculations.

I. Interpret chemical equations.

J. Describe the properties and characteristics of gases and make calculations related to pressure and volume.

K. Describe the properties and characteristics of solutions.

L. Explain the basics of organic chemistry.

ADVANCED PHYSICS

A. Review basic mathematical operations.

B. Review basic metric operations.

C. Explain the basics of motion.

D. Explain force and solve associated word problems.

E. Discuss work, energy and power, and solve associated word problems.

F. Distinguish between heat and temperature.

G. Explain energy in waves and the relationship to sound and light.

H. Explain electric energy and make calculations relating to electric currents.

I. Explain magnetism and electromagnetism and its application to electric motors and generators.

COMPUTERS

A. Demonstrate a knowledge of common computer hardware components.

B. Demonstrate a knowledge of common computer software.

C. Recognize the interdependent relationship between hardware and software.

D. Define common computer terms such as bytes, bits, RAM, ROM, K, data, menus, interface, CPU and DOS.

E. Identify and describe the use of the different parts of the keyboard such as numeric keys, alphabetic keys and function keys.

F. Develop keyboarding skills through the use of computer software packages.

G. Upon completion of the course, type a minimum of 10 w.p.m. with accuracy.

H. Access and operate a Word Processing application system.

I. Access and operate a Spreadsheet and Data Base application system.

J. Access and operate CAL systems.

HANDS-ON

A. Identify generic occupational skills and vocabulary through skills orientation in labs, shops and classrooms.

B. Experience simulated work environment conditions.

C. Demonstrate a knowledge of work place safety practices.

D. Demonstrate increased self-confidence with occupational skills and vocabulary.

E. Complete a pre and post component self-evaluation check list.

WORK ADJUSTMENT

I. Work Adjustment

A. Demonstrate a knowledge and understanding of individual rights and responsibilities in the work place.

B. Demonstrate problem solving and decision making skills in the work place

C. Demonstrate personal skills in the work place such as self-development and interpersonal skills development.

II. Vocational Assessment

A. Develop a personal profile.

B. Develop a career path.

C. Based on the information gathered through the personal profile and occupation research, structure an Individual Training Plan with the assistance of OBS personnel.

III. Job Search

A. Plan and prepare for a job search.

B. Organize and structure a Job Search.

C. Implement job search techniques.

CHAPTER 6.

LINKAGE OF SURVEY RESULTS AND LEARNING OBJECTIVES

LINKAGE OF THE SURVEY FINDINGS AND THE LEARNING OBJECTIVES

Based on the general skill requirements indicated by the survey, a revised set of performance objectives for the OBS/FBO curriculum is proposed. It is important to note, however, that time constraints did not permit the development of models of an integrated curriculum flowing from these terminal and enabling objectives. This step is seen as essential for effective retention of learning and transfer of skills from one area to another. Research has shown that learning retention and transfer of skills is significantly improved when subject matter is taught in large, integrated chunks rather than very small, discrete units.

For consistency with the survey analysis, the information will again be divided into eight categories: reading, writing, other linguistic skills, mathematics, science, computer literacy, work adjustment skills and technical hands-on skills.

In most courses the content was separated into three levels: basic, intermediate and advanced. These levels are intended to correspond with the skills levels identified in the survey: semi-skilled, skilled and paraprofessional. Students are required to master the content of one level before progressing to the next. As students progress through each level, transition is such that it allows for review of previous instruction and the introduction of new concepts.

Following is an analysis of the skill requirements identified in the survey, and an explanation of how they are reflected in the course content.

Reading

Reading at the semi-skilled level is minimal; short memos, notes, simple order forms and occasionally company manuals. To satisfy these requirements, Basic Level Communications develops basic literal and critical comprehension skills. Individuals are trained to interpret simple information and instructions.

In addition to reading instructional and informational material, the skilled and paraprofessional levels are required to identify facts and opinions and locate information using various resources. The Intermediate Communications course therefore provides instruction in the appropriate use and interpretation of resource materials such as directories, periodicals, indices, charts and tables. By identifying main ideas and details and by distinguishing between fact and opinion, and cause and effect, individuals are able to interpret information.

The paraprofessional reads a variety of materials for information and in addition, is required to interpret the information and make decisions based on its content. Through evaluation of style and content of written materials, Advanced Communications is designed to develop critical and analytical reading skills used in the decision making process.

Writing

For the semiskilled, writing is required for short notes or memos and completion of simple forms. Basic Communications therefore provides instruction on basic writing skills including items such as spelling, structure, syntax and an understanding of the writing process. These basic skills will enable individuals to perform basic writing in a clear and correct format.

Writing for the skilled and paraprofessional worker is essentially the same, although more frequent and more complex. The main writing tasks include letters, estimates, correspondence, forms and various reports including financial.

The Intermediate Communications course targetted to the needs of the skilled worker focuses on the writing skills required to prepare letters, memos, summaries and forms. For this level the writing process is studied in relation to how it can be used to effectively organize information and present ideas or information in a clear and interesting format.

The Advanced Communications course develops the ability to locate, analyze, evaluate and synthesize information for the preparation of various reports or papers.

Other Linguistic Skills

Semiskilled workers require listening skills in order to distinguish between fact and opinion, to understand implied meanings, to respond to questions and to follow brief directions or instructions. Speaking skills are required to present information, to give job related instructions or directions, to take part in formal meetings and to engage in dialogue with supervisors.

Through two-way oral communication, Basic Communications develops listening and speaking skills by having individuals ask and respond to questions in a manner appropriate to a given situation. Individuals are required to give and follow directions, recognize key words and details or ask for additional information. Basic presentation skills are developed by having individuals choose, organize and present information on a specific topic. Individuals evaluate the use of language, voice, body language and determine the audience participation/reaction.

In addition to refining speaking and listening skills, the Intermediate and Advanced Communications Courses develop diagnostic skills through the use of reference materials, questioning/probing techniques and reasoning.

Mathematics

Mathematics at the semiskilled level required a minimal set of skills including operation with whole numbers, fractions, decimals and percentages, measurement and estimation of weight, distance, area and volume and recognition of geometric shapes and angles. The Basic Mathematics Core reflects all the skills required by semiskilled level occupations as well as interpreting graphs and calculating perimeter, area and volume of simple geometric shapes.

Skilled level employees are required to make calculations involving whole numbers, fractions, decimals and percentages, interconvert fractions, decimals and percentages, recognize and draw geometric shapes and common angles, interpret drawings and blueprints, interpret graphs, estimate time, weight, distance, area and volume, measure time, weight, distance and volume, use and convert metric and imperial measures, draw objects to scale and take measurements from scale drawings, solve word problems, calculate ratios and proportions, calculate area, perimeter and volume, and solve one variable algebraic problems. The Intermediate Mathematics Core reflects all the skills required by the majority of skilled employees. However, the section on algebra should probably be moved into the technical and business options. A terminal performance objective in measurement and basic geometry should be added to the intermediate core to reflect the survey findings. The Intermediate Math Technical reflects the requirements of the manufacturing, natural resources, construction, service and transportation sectors. The Intermediate Math Business would be applicable to the financial and wholesale/retail sectors.

The paraprofessional employee requires the same skills as the skilled level with the addition of competencies in performing geometric and trigonometric calculations. In general, the Advanced Mathematics objectives are beyond the requirements of paraprofessionals for all but the service, construction and natural resources sectors. Intermediate Mathematics would match the requirements of the paraprofessionals for the manufacturing, transportation, health care, wholesale/retail, financial and education/government sectors.

Science

The survey of employers identified basic topics in general science, biology, chemistry and physics of which an employee would require knowledge in order to function on the job. The number of firms requiring science is limited and association with specific industrial sectors.

In General Science, a knowledge of electricity, levers and/or water were required by the health care, manufacturing, natural resources, construction and education/government sectors. In biology and chemistry no topics were required. In physics, a knowledge of AC/DC electricity, heat and work, energy and power were required by the construction and natural resources sectors.

The limited requirement for science content at the semiskilled level is reflected in the Basic Science terminal performance and enabling objectives. The intent is to develop an awareness and familiarity with the language of science and the method of scientific investigation, as well as to provide a vehicle for the development of communication skills.

At the skilled level, all industrial sectors except financial required a background in general science topics. Only in the health care sector was a knowledge of biology required. Chemistry topics were limited to acids and bases, solutions and gases for five sectors: manufacturing, natural resources, transportation, construction and health care. In physics, the natural resources, health care, manufacturing, service and construction sectors required a knowledge of the majority of topics identified. However, the percentage of firms requiring biology, physics and chemistry knowledge was only thirty to forty-nine percent in each sector. The Intermediate Science Course presents a diversity of content areas providing an introduction to the major fields of science; the objectives reflect all the content identified through the survey. However, as the employer demand for specific science knowledge is low, the specific objectives selected for individual programs should be based upon the students occupational goals with technical and health care occupations tending to require a greater degree of science knowledge.

In general, the paraprofessional requires less general science knowledge than does the skilled worker with the majority of firms in only the natural resources and construction sectors requiring these topic areas. Biological knowledge was necessary only for occupations within the health care industry. Topics in chemistry were of particular importance to the manufacturing, natural resources and health care sectors. A background in physics was required by the natural resources, health care and construction sectors. The paraprofessional tends to require more knowledge of physics and chemistry than the skilled worker. The terminal performance and enabling objectives for the advanced science are organized into three subject areas: chemistry, biology and physics. As for the skilled level, the specific objectives selected for an individual program should be based on the occupational goal, and where appropriate, the prerequisites for entry to a post secondary program.

Students entering technical and health care related occupations would tend to be those individuals who most require advanced science literacy.

Computer Literacy

Although semiskilled workers do not require computer skills, the Computer Course provides the opportunity for these individuals to interact with computer equipment through the use of Computer Assisted Learning (CAL) packages. This exposure to computers will enable individuals to overcome the fear of computers, to understand the basic relationship between hardware and software and to become familiar with some basic computer terminology.

Survey results indicated that for the skilled and paraprofessional levels, computer literacy at the entry level would be advantageous and in some sectors essential. For these individuals, the course provides some basic computer theory such as components of hardware and software and computer terminology. After the initial theory course, keyboarding skills would be developed through the use of software packages for word processing, spreadsheet or data base applications depending on the needs of the individual.

Work Adjustment

Work Adjustment Skills are required by the majority of employees in all occupation sectors and at all occupational levels.

Through discussions, presentations, speakers, interviews, role plays, research activities, seminars and work shops, the Work Adjustment Course emphasizes the importance of proper attitudes, interpersonal skills and personal behaviours and demonstrates how they affect employee performance on specific job functions and tasks.

Through practical applications, students develop the skills required to follow schedules and instructions, manage time, adapt to change, make effective decisions, solve problems, demonstrate personal motivation and develop positive communication techniques and positive attitudes toward work.

Although the skilled and paraprofessional workers had a higher requirement, at all levels there was a need for knowledge of basic work place hazards, first aid, legal rights and responsibilities, safe work place practices, the Health and Safety Act and the Worker's Compensation Act. The course addresses all areas at a basic level and provides access to additional resource materials where required.

The Vocational Assessment component of this course assists students to develop a personal profile of employment interests and opportunities and to develop a career path. Based on the results of this assessment, students will be able to effectively construct their training plan with consideration for the educational and employment requirements for occupations in which they indicate an interest.

The Job Search component of this course enables students to apply the knowledge which they have gained through the personal and vocational assessments. Students conduct a job search including performing company research, identifying job vacancies, and arranging informational interviews. Once prospective employers have been identified and contacted, students participate in interviews and perform the necessary follow-up activities. For students who are not continuing with further education, this component of the program is of critical importance in securing meaningful employment in the community.

Technical Hands-On Skills

The need for technical hands-on skills varies significantly depending on the type of occupation the individual is seeking. Generally the only skills a paraprofessional might require are for basic measuring.

The most important part of this course is the identification of various tools, skills and vocabulary used in the given occupational field. Through work placements, job shadowing and participation in lab training sessions, the students develop the skills required to use basic tools and equipment identified for their chosen occupational field. Students are also required to demonstrate safe work practices. Pre and post self-evaluations are conducted to identify the individuals progress in each area.

APPENDICES

APPENDIX I

ANGLOPHONE EMPLOYERS SURVEYED

SECTOR Construction

1. C. & C. Enterprises
126 Green Street
P.O. Box 993
Sarnia, Ontario N7T 7K4
* (B) Electrical Construction

2. Delcan Corporation
214-1069 Wellington Road South
London, Ontario N6E 2H6
(B) Consulting Engineers

3. Colony Construction
525 Exeter Road
London, Ontario N6E 2Z3
(B) General Contractor

4. Pioneer Construction
3319 Kingsway
Sudbury, Ontario
(B) Road Construction

5. Pitton Plumbing
190 Lanark Street
Hamilton, Ontario L8E 4B3
(B) Plumbing

6. Canadian Home & Renovation Team
28 Bloomingdale Road
Kitchener, Ontario N2K 1A2
(B) Constuction

7. Tri County Refrigeration Ltd.
1175 Crawford Avenue
Windsor, Ontario N2K 1A2
(B) Commercial Refrigeration and Heating Contractors

8. Century Construction Co.
705 Glengary Avenue
Windsor, Ontario N9A 1R4
(B) General Construction

* (B) type of business

* (P) type of product

9. Dezan Building Systems Ltd.
5180 Ure Street
R.R. #1
Oldcastle, Ontario N0R 1L0
(B) Commercial Building Construction

10. Red-d-Mix
170 Byng Avenue
Chatham, Ontario   N7M 3E2
(P) concrete

11. Ray Knight Construction
10 Kitchener Street
Orillia, Ontario   L3V 6K7
(B) general construction

12. Dash Construction
1379 Mosley Street
Wasaga Beach, Ontario   L0L 2S0
(B) heavy road construction

13. Timbersmith Log Construction Ltd.
General Delivery
Hillsdale, Ontario L0L 1V0
(B) log home contracting

14. Bramalea Ltd.
1867 Yonge Street
Toronto, Ontario   M4S 1Y5
(B) log home contracting

15. Sheet Metal Workers International Local 473
380 York Street
London, Ontario   N6B 1P9
(B) Union Hiring Hall

16. Conestoga Roofing
331 Sheldon Drive
Cambridge, Ontario N1T 1B1
(B) repair, maintenance, construction

17. Pace Electric Ltd.
69 Wharncliffe Road
London, Ontario
(B) Electrical Contractor

18. Electricians Union Local 120
P.O. Box 388
Lambeth, Ontario   N0L 1S0
(B) Union Hiring Hall

19. David Gilchrist
907 Devine Street
Sarnia, Ontario N7T 1X3
(B) Architectural Office

20. Edland Building Systems Inc.
189 South Service Road
Grimsby, Ontario L3M 4H7
(B) Industrial Building Construction

21. Ironwood
P.O. Box 296
Grimsby, Ontario L3M 4G5
(B) Industrial Building Construction

22. Mike Moore Contracting Ltd.
R.R. #2
Burk's Falls, Ontario P0A 1C0
(B) house & cottage building

SECTOR Finance

1. Canadian Imperial Bank of Commerce
190 North Front Street
P.O. Box 160
Sarnia, Ontario N7T 7H9
(B) Manager

2. St. Willibrod Community Credit Union
151 Albert Street
London, Ontario N6A 1L9
(B) Co-operative Finance Services

3. Stevenson Hunt Insurance Brokers Ltd.
412-200 Queens Street
London, Ontario
(B) Insurance

4. Mutual Life of Canada
70 Collier Street
Suite 901
Orillia, Ontario L4M 4Z2

5. City Insurance Ltd.
358 Christina Street North
Sarnia, Ontario N7T7L5
(B) Trust Company

SECTOR Finance (continued)

6. National Trust
250 Christina Street North
Box 2229
Sarnia, Ontario
(B) Trust Company

7. Mutual Life
201 North Front Street
Sarnia, Ontario N7T 7T9
(B) Life Insurance

8. The Financial Centre
128 Hurontario Street
Collingwood, Ontario L9Y 2L8
(B) Financial Services

9. Huronia Trust
2 Mississauga Street East
Box 68
Orillia, Ontario L3V 6H9
(B) Trust Company

10. Royal Trust
137 Dundas Street
London, Ontario N6A 1A9
(B) Financial Consulting

11. Golden Financial Services
203-1638 Upper James
Hamilton, Ontario L9B 1K4
(B) Mortgage Brokers

12. Canadian Imperial Bank of Commerce
1 King Street West
Hamilton, Ontario L84 3H4
(B) Bank

13. Canada Trust
20 Eglinton Avenue West, 10th floor
Toronto, Ontario M4R 2E2

14. Coopers & Lybrand
145 King Street West
Toronto, Ontario M5H 1V8
(B) Financial Services - accounting & consulting

SECTOR Finance (continued)

15. Merrill Lynch Canada Inc.
200 King Street West
Toronto, Ontario M5H 3W3
(B) Investment Co.

16. Bank of Nova Scotia
1 Pine Street South
Timmins, Ontario

17. F.B.D.B.
83 Algonquin Blvd. West
Timmins, Ontario
(B) Financial & Technical assistance for new business

18. National Bank of Canada
500 Ouellete Avenue
Windsor, Ontario N9A 1B3
(B) Chartered Bank

19. Canada Trust
190 University Avenue
Windsor, Ontario N9A 6L4
(B) Trust Company

20. Sterling Trust
73 Mississauga Street East
Box 2239
Orillia, Ontario L3V 6J3
(B) Trust Company

21. The Personal Insurance Co. of Canada
703 Evans Avenue
Etobicoke, Ontario M9C 5A7
(B) Financial Services

22. Royal Bank
383 Richmond Street
London, Ontario N6A 3C4
(B) Banking

23. AVCO
385 Frederick Street
Kitchener, Ontario N2H 2P2
(B) Lending Service

SECTOR Finance (continued)

24. Venture Economics Canada Ltd.
204 Richmond Street West
Suite 302
Toronto, Ontario M5V 1N1
(B) Venture Capital Consulting/Data Base

25. Niagara Credit Union
344 Lake Street
St. Catherines, Ontario L2M 6P6
(B) Credit Union

26. Touche Ross
63 Church Street
Suite 500
St. Catherines, Ontario L2R 6S4
(B) Accounting

SECTOR Government/Education

1. George Brown College
160 Kendall Avenue
Toronto, Ontario H5T 2T9

2. Corporation of the City of Toronto
City Hall
Toronto, Ontario
H5H 2M2
(B) City Government

3. Corporation of the City of North York
5100 Yonge Street
North York, Ontario M2N 5V7
(B) City Government

4. Georgian College

5. Hastings County Board of Education
156 Ann Street
Belleville, Ontario

6. Simcoe County Board of Education
99 Ferris Lane
Barrie, Ontario L4M 2Y2
(B) School Board

SECTOR Government/Education (continued)

7. Corporation of the City of Barrie
Box 400
Barrie, Ontario L4M 4T5
(B) City Government

8. City of Orillian
Box 340
Orillia, Ontario L3V 6J1
(B) City Government

9. Canada Employment & Immigration
228 Dundas Street East
Belleville, Ontario
(B) Government Agency

10. Sudbury Manitoulin Children's Aid Society
1492 Paris Street
Sudbury, Ontario
(B) Child Service

11. Health Care Support Services
7 Craig Street
Perth, Ontario K7H 1X7
(B) Job Development Project

12. FUTURES Program
Algonquin College
1644 Bank Street
Ottawa, Ontario K1V 7Y6
(B) Youth Traning Program

13. Ottawa University
110 Wilbrod
Dept. of Human Resources
Ottawa, Ontario K1N 6N5

14. Canadian Radio & Television Commission
1 Promenade de Portage
Hull, Québec K1A 0N2

15. Algonquin College
1385 Woodroffe
Ottawa, Ontario K2G 1V8

16. Peterborough/Victoria Separate School Board
459 Reid Street
Peterborough, Ontario

SECTOR Government/Education (continued)

17. Ministry of Agriculture & Food
55 George Street North
Peterborough, Ontario

18. Ministry of Corrections
223 Aylmer Street
Peterborough, Ontario

19. Peterborough County Board of Education
150 O'Carroll Street
Peterborough, Ontario

20. Humber College
205 Humber College Blvd.
Etobicoke, Ontario M9W 5L7
(B) Education

21. Ministry of Labour, Handicapped Employment Program
400 University Avenue
Toronto, Ontario M7S 1T7

22. Worker's Compensation Board
30 Cedar Street
Sudbury, Ontario P3E 1A4
(B) Counselling injured workers

23. OPSEU
1901 Yonge Street
Toronto, Ontario M4S 2Z5
(B) Union

24. City of York
2700 Eglinton Avenue West
Toronto, Ontario M4M 1V1
(B) Government

25. Ministry of Revenue
33 King Street West
Oshawa, Ontario L1H 8H5

SECTOR Health Care

1. Montgomery Lodge
145 Farley Avenue
Belleville, Ontario
(B) Nursing Home

SECTOR Health Care (continued)

2. Hastings Manor
Trent Road
Belleville, Ontario
(B) Home for Aged

3. Fairview Manor
Almonte, Ontario
(B) Nursing Home - Elderly

4. Lanark Lodge
R.R. #4
Perth, Ontario K7H 3C6
(B) Nursing Home - Elderly

5. Belleville General Hospital
265 Dundas Street East
Belleville, Ontario

6. Bellcrest Villa
431 Dundas Street West
Belleville, Ontario
(B) Nursing Home

7. Dr. John Faulkner
6 Glenwood Medical Building
Suite 107
Brockville, Ontario K6V 2T3

8. McKellar Hospital
325 S. Archibald Street
Thunder Bay, Ontario P7E 1G6

9. Ellenvale Nursing Home
R.R. #3
Perth, Ontario
(B) Nursing for Developmentally Handicapped

10. Cochrane Temiskaming Resource Centre
Hwy. #101 East
South Porcupine, Ontario
(B) Residential Facility serving mentally handicapped

11. Hogarth Westmount Hospital
300 N. Lillie Street
Thunder Bay, Ontario P7C 4Y7
(B) Hospital

SECTOR Health Care (continued)

12. Northwestern Regional Centre
Box 3270
580 N. Algoma
Thunder Bay, Ontario P7B 5J8
Program & Residential Centre for
Developmentally Handicapped

13. Royal Ottawa Hospital
1145 Carling Avenue
Ottawa, Ontario K1Z 7K4

14. Civic Hospital
Wellar Street
Peterborough, Ontario

15. Extendicare
80 Alexander Avenue
Peterborough, Ontario
(B) Long-Term Nursing Home

16. Fairhaven Home for the Aged
Langton Street
Peterborough, Ontario

17. Ottawa Civic Hospital
1053 Carling Avenue
Ottawa, Ontario K1Y 4E9
(B) Health Care Training

18. Ottawa Civic Hospital
1053 Carling Avenue
Ottawa, Ontario K1Y 4E9
(B) Hospital

19. Lakehead Psychiatric Hospital
580 Algoma Street North
Thunder Bay, Ontario P7B 5G4
(B) Psychiatric care

20. Dawson Court, Grandview Lodge
523 Algoma Street North
Thunder Bay, Ontario P7A 5C2
(B) Home for the Aged

21. St. Vincent Hospital
60 Cambridge
Ottawa, Ontario
(B) Hospital

SECTOR Health Care (continued)

22. Riverside Hospital
1967 Riverside
Ottawa, Ontario K1H 8P4

23. Queensway Carleton Hospital
3045 Baseline
Nepean, Ontario K2H 8P4

24. Sudbury General Hospital
700 Paris Street
Sudbury, Ontario P3E 3B5

25. Civic Hospital
750 Scollard Street
North Bay, Ontario

26. Castlehome for the Aged
400 Olive Street
North Bay, Ontario

27. Riverview Nursing Home
1155 Water Street
Peterborough, Ontario

28. Comcare
207 North Archibald Street
Thunder Bay, Ontario P7C 3X9
(B) Nursing & Home Health Care

29. Port Arthur General Hospital
460 Court Street (North)
Thunder Bay, Ontario P7A 4X6

30. Dental Designs
3-59 Court Street North
Thunder Bay, Ontario P7A 4T9
(B) Dental Laboratory

31. Community Memorial Hospital
451 Paxton Street
Port Perry, Ontario P0B 1N0

SECTOR Manufacturing

1. American Standard
1401 Dupont Street
Toronto, Ontario
(P) Bathroom Fixtures

SECTOR Manufacturing (continued)

2. T.R.E.L. of Sarnia
1165 Confederation Street
Sarnia, Ontario
(P) Millwright/Machine Shop

3. Sandrin Brothers
150 Exmouth Street
Sarnia, Ontario N7T 7H8
(P) Mechanical Equipment Repair

4. Redman Machining and Metallizing
441 Industrial Road
London, Ontario N5W 5R6
(P) Machining & Design

5. General Motors
P.O. Box 5160
London, Ontario N6A 5R6
(P) Locomotive & Defence products

6. K.F.W. (Division of T.I. Canada)
20 Progress Drive
Orillia, Ontario L3Y 6H1
(P) Manufacturing Control Manager (aircraft engine components)

7. Redlaw Industries Ltd.
255 West Street
Orillia, Ontario L3V 6L3
(P) Personnel Manager (manufacture automotive castings)

8. C.I.L. Lambton Works
3809 St. Clair Parkway
Courtright, Ontario N0N 1H0
(P) Manufacture Fertilizer

9. ESSO Petroleum (Research Division)
P.O. Box 3022
Sarnia, Ontario N7T 7M1
(B) Research & Development Laboratory for Lubricant Production

10. Polysar Ltd.
South Vidal Street
Sarnia, Ontario N7T 7M2
(P) Rubber & other petrochemical products

SECTOR Manufacturing (continued)

11. Munroe Acto Equipment Co. of Canada
Box 800
Owen Sound, Ontario N4K 5Z9
(P) Manufacturing ride control products

12. Northern Telecom
Sise Road
London, Ontario N6K 4N3
(B) Telecommunication Terminals

13. Ontario Hydro
1075 Wellington Street
London, Ontario N6E 1M1
(B) Hydro

14. E.D. Smith
944 Hwy. #8
Winona, Ontario L0R 2L0
(P) Food

15. Litton System Canada
10 Kilfield Road
Rexdale, Ontario M2W 5A7
(B) Aerospace Manufacturing

16. Family Pastimes
R.R. #4
Perth, Ontario K7H 3C6

17. Florsheim Inc.
824 Exeter Road
London, Ontario N6E 1L5
(B) Shoe Manufacturer

18. Ramsden Industries Ltd.
128 Oakland Avenue
London, Ontario N5N 4H6
(B) Fabrication of Metals

19. Arrow Co.
112 Benton Street
London, Ontario N2G 4A9
(B) Shirt Manufacturing

20. Pine Forest Furniture
55 Canbar Street
Waterloo, Ontario
(B) Furniture Manufacturing

SECTOR Manufacturing (continued)

21. Brute Welding/Fabrication Ltd.
1230 Balmoral Road North
Cambridge, Ontario N1R 5Y2

22. Windsor Tool & Die
1680 Kildare Road
Windsor, Ontario N8W 2W4
(B) Tool & Die Manufacturing

23. Novacor
P.O. Box 3042
Sarnia, Ontario N7T 7M1
(P) Petrochemical products

24. Roxul
551 Harrop Drive
Milton, Ontario L9T 3H3
(P) Insulation

25. ILO Industries Ltd.
71 Orenda Road
Brampton, Ontario L6W 1V8
(P) Roofing products

26. Northern Telecom Canada
8200 Drane Road
Brampton, Ontario L6V 2M6
(P) Telecommunications

27. Stanley Door Systems
42 Queen Elizabeth Blvd.
Toronto, Ontario M8Z 1M1
(P) Doors

28. Xerox Canada Inc.
5650 Yonge Street
North York, Ontario M2M 4G7
(P) Office products

29. Nero
312 Adelaide street
Suite 602
Toronto, Ontario M5v 1R2
(P) Leather garment design & manufacturing

30. E.B. Eddy Pulp and Paper Co.
Narine, Ontario
(P) Lumber

SECTOR Manufacturing (continued)

31. Diversitech General
P.O. Box 1002
Welland, Ontario L3B 5R9
(P) Rubber

SECTOR Natural Resources/Utilities

1. Public Utilities Commission
111 Horton Street
London, Ontario N6B 3N9
(B) Utility

2. INCO
Copper Cliff, Ontario
([illegible]) Mining

3. McGraw Fisheries
Box 52
Bayfield, Ontario N0M 1G0
(B) Commercial Fishing

4. Ram Petroleums Ltd.
435 Exeter Road
London, Ontario N6A 2Z3
(B) Mining

5. McKerlie Solar Systems
138 Garden Crescent
Hamilton, Ontario L8V 4T4
(B) Solar Energy

6. K.B.M. Forestry Consultants
360 Mooney
Thunder Bay, Ontario P7B 5R4
(B) Forestry Consulting & Sales

7. Great Lakes Forest Products
P.O. Box 430
Thunder Bay, Ontario P7C 4W3
(P) Forest Products

8. Falconbridge Nickel Mines
Limberley Street
Falconbridge, Ontario
(B) Mining

SECTOR Natural Resources/Utilities

9. Falconbridge Ltd.
Kidd Creek Division
Hwy. #101
Timmins, Ontario
(B) Mining Co.

10. Superior Propane
Highway #245
P.O. Box 605
Guelph, Ontario N1H 6L3
(B) Appliance/Gas Service to Public

11. Thunder Bay Hydro
34 North Cumberland
Thunder Bay, Ontario P7A 4L4
(B) Hydro Electric Power Utility

12. Windsor Utilities Commission
787 Oriellette Avenue
Windsor, Ontario N9A 5T7
(B) Urban Utility

13. Superior Propane
Highway #2, West
Chatham, Ontario N7M 5M1
(B) Propane Gas Distribution

14. Union Gas Ltd.
50 Keil Drive North
Chatham, Ontario N7M 5M1
(B) Utility - Natural Gas

15. Lambton Generating Station
Box 2100
Courtright, Ontario N0N 1H0
(B) Electric Power Generating System

16. Sarnia Hydro
160 George Street
Sarnia, Ontario N7T 7L6
(B) Electrical Utility

17. ICG Utilities
1230 Carrick Street
Thunder Bay, Ontario
(B) Gas Utilities

SECTOR Natural Resources/Utilities (continued)

18. Provincial Papers
P.O. Box 2450
Thunder Bay, Ontario P7B 5E9
(P) Fine paper products

19. MacMillan Bloedel Ltd.
P.O. Box 608
Thunder Bay, Ontario P7C 4W6
(P) Waferboard

20. Trans Canada Pipelines
91 Cumberland Street South
Thunder Bay, Ontario P7B 6A7
(b) Natural gas pipeline

21. Noranda
960 Alloy Drive
Box 2656
Thunder Bay, Ontario P7B 5G2
(B) Mineral Exploration

22. Ottawa Hydro
3025 Albion Road
Ottawa, Ontario K1G 3S4
(B) Public Utility

23. North Bay Hydro
1350 Fisher Street
North Bay, Ontario
(B) Hydro

24. MJM Aquaculture
Gore Bay, Ontario
(B) Fish farming

25. Suncor Inc.
P.O. Box 307
Sarnia, Ontario N7T 7J3
(P) Refining Crude Oil

26. Purdy's Fisheries
Riverfront
Point Edward, Ontario N7V 1J8
(B) Commercial Fishing

27. Ministry of Natural Resources
Box 1070
Fonthill, Ontario L0S 1E0
(B) Regulations Office

SECTOR Service/Hospitality

1. Trudeau Motors Ltd.
   3145 Station Street
   Belleville, Ontario
   (B) Car Dealership

2. Mr. Gas
   Highway 7
   Perth, Ontario
   (B) Gas Bar

3. City Cleaners & Shirt Launderers
   160 Moira Street
   Belleville, Ontario
   (B) Dry Cleaner & Launderers

4. Lester's Restaurant
   48 Dundas Street West
   Belleville, Ontario

5. Colonel By Child Care Centre
   Loeb Building
   Carleton University
   Ottawa, Ontario K1S 5B6
   (B) Child Care Centre

6. Team Effort Services
   399 Mooney Street
   Thunder Bay, Ontario
   (B) Labour Oriented Service

7. Dewit & Castellan Architects
   289 Cedar, Suite 302
   Sudbury, Ontario
   (B) Architects

8. Northern Cable
   500 Barrydowne Road
   Sudbury, Ontario
   (B) Cable Television

9. Sudbury Orthopedic & Sports
   Physiotherapy Centre
   70 Larch Street
   Sudbury, Ontario
   (B) Physiotherapy

SECTOR Service/Hospitality (continued)

10. Midnorth Kenworth
1035 Falconbridge Road
Sudbury, Ontario
(B) Sales & Services (trucks)

11. Information Sudbury
69 Elm Street West
Sudbury, Ontario
(B) Information Service

12. Ready Rentals Supply Ltd.
2505 Lasalle Blvd.
Sudbury, Ontario
(B) Rental & Supply

13. Sawchuck, Peach Associates
Architect Planners
198 Oak Street
Sudbury, Ontario

14. Endleman Holden Gossling Inc.
174 Elm Street West
Sudbury, Ontario

15. Arbor Vitae Enterprises
R.R. #4
Perth, Ontario K7H 3C6
(B) Tree planting

16. Ross Pope Accountants
101 Cedar Street
Timmins, Ontario
(B) Accounting

17. Norcan Travel
273 3rd Avenue
Timmins, Ontario
(B) Travel Agent

18. March of Dimes
84 Pine Street South
Timmins, Ontario
(B) Voc. Reh. - for handicapped

19. Joe's Tree Service
1502 Main Street East
Hamilton, Ontario L8K 1E1
(B) Service to Residential Trees

SECTOR Service/Hospitality (continued)

20. Japan Camera Centre
1101 West Arthur
Thunder Bay, Ontario
(B) Photofinishing

21. Wiehenair Ltd.
Vickers Heights, Ontario
P0T 2Z0
(B) Air Transportation - fly in

22. Fleming Systems Corp.
1118 Roland
Thunder Bay, Ontario P7B 5L9
(B) Custom-made software

23. Thunder Bay Community Auditorium Inc.
450 Beverly Street
Thunder Bay, Ontario P7B 5E8
(B) Entertainment

24. Quick Silver Energy Services
Box 460
Perth, Ontario K7H 3G1
(B) Insulation & General Contractor

25. La Gitane
2702 Alta Vista Drive
Ottawa, Ontario K1N 6T4
(B) Beauty Salon

26. Westin Hotel
11 Colonel By Drive
Ottawa, Ontario K1N 9H4
(B) Hotel

27. Rock Haven Motor Hotel
1275 Lansdowne Street West
Peterborough, Ontario
(B) Hotel/Restaurant

28. Twin Cleaners Ltd.
781 Monaghan Road
Peterborough, Ontario
(B) Dry/Cleaners/Launderers

29. Red Oak Inn
100 Charlette Street
Peterborough, Ontario

SECTOR Service/Hospitality (continued)

30. Red Lobster Restaurant
1460 Merivale Road
Ottawa, Ontario
(B) Restaurant

31. Loch Homand Ski Area
R.R. #4
Thunder Bay, Ontario P7C 4Z2
(B) Ski resort

32. Lakehead Motors Ltd.
951 Memorial Service
Thunder Bay, Ontario
(B) Automotive Dealership

33. Dupont Leasing Ltd.
556 W. Arthur
Thunder Bay, Ontario P7E 5R7
(B) Automotive Leasing & Sales

34. Valbay Hotel Ltd.
1 Valhalla Inn Road
Thunder Bay, Ontario P7E 6J1
(B) Hotel

35. Complete Tree Service
Box 150, 448 Carlisle Road
Carlisle, Ontario L0R 1H0
(B) Tree Care/Consulting/Disposal

36. Canada Post
Annex B, Sir Alexander Campbell Building
Ottawa, Ontario K1A 0B1
(B) Public Mail Service

37. Royal LePage
1375 Woodroffe Avenue
Ottawa, Ontario K1A 0B1
(B) Real Estate

38. Pinewood Park Hotel
Hwy. #11 South
North Bay, Ontario

39. F.J. Dellandrea Place
Commerce Crescent Wallace Road
North Bay, Ontario
(B) Vocational Training Complex

SECTOR Service/Hospitality (continued)

40. Almonte Public Library
Box 820
Almonte, Ontario K0A 1A0

41. Holiday Ford Ltd.
1555 Lansdowne Street West
Peterborough, Ontario
(B) Car Dealership

42. Peterborough Floral Co.
129 Hunter Street West
Peterborough, Ontario
(B) Florist

43. Holiday Inn - Oshawa
1011 Bloor Street
Oshawa, Ontario L1H 7K6

44. Sheridan Chev. Olds
1800 Kingston Road West
Pickering, Ontario L1V 1C6
(B) Car Dealership

SECTOR Transportation

1. The Bulk Carriers Co.
893 Campbell Street
Box 368
Sarnia, Ontario N7T 7J2
(B) Bulk Liquid Truck Transport

2. Provost Cartage Inc.
133 Kendal Street
Point Edward, Ontario H1C 1C4
(P) Transport Refined Petro-Chemical Products

3. Kingsway Transports Ltd.
540 First Street
London, Ontario N5V 1Z3
(B) Trucking

4. Air Muskoka
R.R. #1
Gravenhurst, Ontario
(B) Passenger Service, Air Freight

SECTOR Transportation

5. Orillia - Barrie Transport
173 West Street South
Box 733
Orillia, Ontario L3V 6K7
(B) Truck Transportations

6. Healey Transportation Ltd.
10 Gile Street
Smith Falls, Ontario
(B) School Buses, Coaches, Vans

7. Sarnia Transit
1169 Michener
Sarnia, Ontario N7S 4W3
(B) Municipal Public Transport

8. ABLE Taxi
28 West Street North
Orillia, Ontario L3V 5B8
(B) Cab Company

9. U-Need-A
927 Dundas Street
London, Ontario
(B) Taxi

10. Timmins Transit
171 Iroquois Street
Timmins, Ontario
(B) City Transit

11. Star Transfer
740 Pine Street
Timmins, Ontario

12. Guelph Transportation Commission
50 Municipal Street
Guelph, Ontario N1G 1G9
(B) Local Transit System

13. United Trails
1560 Victoria Street North
Kitchener, Ontario N2B 3E5
(B) Chartered Tours

14. Canadian National Railways
(Equipment Division)
Box 4
Vickers Heights
(B) Railways

SECTOR Transportation (continued)

15. Hammond Transportation Ltd.
Box 441
Bracebridge, Ontario P0B 1C0
(B) School Busees, Charters, Tours

16. O.C. Transpo
1500 St. Laurent Blvd.
Ottawa, Ontario K1G 0Z8
(B) Public Transit

17. Ottawa International Airport
50 Airport Road
Gloucester, Ontario K1V 9B4

18. Minery Company Ltd.
815 Fort William Road
Thunder Bay, Ontario P7B 3A4
(B) Greyhound Agent

19. Toronto Transit Commission
1138 Bathurst Street
Toronto, Ontario M5R 3H2
(B) Transportation

20. Voyageur Colonial Ltd.
265 Catherine
Ottawa, Ontario K1R 7S5
(B) Passenger Transportation

21. City Transit
Worthington Street
North Bay, Ontario

22. Voyageur Airways
P.O. Box 1734
C.F.B. North Bay, Ontario P0H 1P0
(B) Airline

23. Manitoulin Transport
Gore Bay, Ontario

24. McKeirtt Trucking
Box 2567
Thunder Bay, Ontario P7B 5G1
(B) Trucking

SECTOR Transportation (continued)

25. Bearskin Lake Air Service Ltd.
216 Round Blvd.
Thunder Bay, Ontario P7E 3N9
(B) Airline - Scheduled & Charter Repairs and Maintenance

26. St. Lawrence Seaway Authority
P.O. Box 370
St. Catherines, Ontario L2R 6V8
(B) Transportation

27. Can-Truck Transportation Ltd.
1900 Boundary Road
P.O. Box 536
Whitby, Ontario L1N 5B3

SECTOR Wholesale/Retail

1. K-Mart Canada Ltd.
390 North Front Street
Belleville, Ontario

2. Miracle Food Mart
Quinte Mall
390 North Front Street
Belleville, Ontario
(B) Retail Food

3. Sears Canada Inc.
Quinte Mall
390 North Front Mall
Belleville, Ontario
(B) Retail

4. Fitzsimmons
840 North McKellar Street
Thunder Bay, Ontario
(B) Wholesale Food Distributor

5. Shaw's Bakery
240 Sigona Street South
Thunder Bay, Ontario
(B) Commercial Bakery

6. Northco Foods Ltd.
906 E. Victoria
Thunder Bay, Ontario P7C 1B4
(B) Franchising Head Office - donuts

SECTOR Wholesale/Retail (continued)

7. M. Loeb Ltd.
1010 Lorne Street
Sudbury, Ontario
(B) Food Wholesale

8. A. & B. Office Equipment
2148 Lasalle Blvd.
Sudbury, Ontario P3A 2A7
(B) Office Equipment, Furniture, Retail

9. Sears Canada Inc.
1344 LaSalle Blvd.
Sudbury, Ontario P3A 1Z3
(B) Retail Sales

10. N.P.L. Ontario
Unit 5, 977 Alloy Drive
Thunder Bay, Ontario P7B 5Z8
(B) Drug Wholesaling

11. Zellers
110 West Redwood Ave.
Thunder Bay, Ontario P7C 1Z4
(B) Retail Merchandise

12. Ottawa Meat and Fish
800 Belfast Road
Ottawa, Ontario K1G 0Z5
(B) Wholesale Food Supplier

13. Sears Canada Ltd.
Lansdowne Place Mall
645 Lansdowne Street West
Peterborough, Ontario
(B) Retail

14. Noble Bean
R.R. #1
McDonalds Corner, Ontario K0G 1M0
(P) Tempeh Food Products

15. Shawdox Fax
88 Gore Street East
Pembrooke, Ontario
(B) Retail Clothing & Jewellery

16. Top Banana Ltd.
1900 Bank Street
Ottawa, Ontario
(P) Produce

SECTOR Wholesale/Retail (continued)

17. Woolco
New Sudbury Shopping Centre
Sudbury, Ontario
(P) Selling Merchandise

18. K-Mart
1485 LaSalle
Sudbury, Ontario P3A 1Z9

19. Zellers Inc.
390 Lakeshore Drive
North Bay, Ontario

20. K-Mart
300 Lakeshore Drive
North Bay, Ontario

21. Peter Gorman Wholesale Ltd.
771 Webber Avenue
Peterborough, Ontario

22. Towers Department Stores Ltd.
950 Lansdowne Street
Peterborough, Ontario

23. Acklands Limited
800 Norah Crescent
Thunder Bay, Ontario P7C 4T8
(B) Industrial and Automotive Supplier

24. Canadian Tire
County Fair Plaza
1030 Dawson Road
Thunder Bay, Ontario
(P) Automotive, Hardware, Houseware and Leisure Goods

25. Peterborough Wholesales Ltd.
910 High Street
Peterborough

26. Sears Canada
King & Stevenson Road
Oshawa, Ontario L1J 2K6

APPENDIX 2

FRANCOPHONE EMPLOYERS SURVEYED

SECTEUR de la construction

1. Les Meubles Valco Ltée
2850 ave. Marleau
Cornwall, Ontario K6H 5T5
* (E) Manufacture de meubles

2. Menard Bros. Construction
P.O. Box 38
Cornwall, Ontario K6H 5R9
(E) Home Construction

3. Dibblee Construction Limited
P.O. Box 248
Cornwall, Ontario K6H 5R8
(E) Asphalt Construction

4. Réjean Ouimet Construction
123 ch. Cornwall Centre
Cornwall, Ontario K6K 1K6
(E) rénovation de foyer

5. Brunet Bros. Ltd.
1525 rue Pitt
Cornwall, Ontario K6H 5V2
(E) Construction

6. Combustion Engineering Canada Inc.
P.O. Box 1029
Cornwall, Ontario K6H 5Y1
* (P) Metal Fabrication

7. Laframboise Mechanical Ltd.
1397 rue Rosemount
Cornwall, Ontario
(E) Entrepreneur mécaniques électriques de plombiers et de chauffage

8. Westfront Construction Ltd.
C.P. 428
Cornwall, Ontario K6H 6T2
(E) Excavation, camionnage, louage d'équipment

* (E) entreprise

* (P) produit

SECTEUR financier

1. Collins Barrow - Maheu Noiseux
152 Troisieme Ave.
Timmins, Ontario P4N 1C5
(E) Comptabilité

2. Banque Nationale
151 Algonquin Est.
Timmins, Ontario P4N 1A6

3. Caisse Populaire St-Charles de Timmins
100 av. Wilson
Timmins, Ontario P4N 2S9
(E) Bank

4. Midland - Doherty Ltd.
28 sud, rue Pine
Timmins, Ontario P4N 2J8
(E) Courtier en bourses sécuritaires

5. Banque Canadienne Impériale de Commerce
829 George
C.P. 250
Hearst, Ontario P0L 1N0
(E) Banque

6. Banque Nationale du Canada
2 Lisgar
Sudbury, Ontario P3E 3L6
(E) institution financiere

SECTEUR de la fonction publique/education

1. Futures/Avenir
313 Railway
Timmins, Ontario P4N 2P4

2. Conseil des Ecoles Séparées Catholique
du District de Timmins
36 sud, rue Birch
Timmins, Ontario P4N 2A5

3. Centre d'Emploi du Canada
273 3e avenue
Timmins, Ontario P4N 1E2
(E) Administration du Centre d'emploi

4. Ministère de la Formation Professionnelle
107 rue Wilson
Timmins, Ontario
(E) Service de consultation

SECTEUR de la fonction publique/education (suite)

5. Ville de Rayside - Balfour
C.P. 639
Chelmsford, Ontario P0M 1L0

SECTEUR soins de la santé

1. Maison de Santé Bestview
201 est, 11^{e} rue
Cornwall, Ontario K6H 2Y6

2. Eastern Ontario Health Unit
1000 Pitt Street
Cornwall, Ontario K6J 3S5

3. Canadian Red Cross Society
333 Second Street East
Cornwall, Ontario K6H 2Y8
(E) Non-profit Volunteer Org.

4. Cornwall General Hospital
510 Second Street East
Cornwall, Ontario K6H 1Z6

5. Hôpital Hotel Dieu

6. Manoir Lisieux
1319 rue Lisieux
Cornwall, Ontario K6H 1N0
(E) Domiciliaire

7. Chateau Jardins - Lancaster
C.P. 429
Lancaster, Ontario K0C 2J0
(E) Maison de Santé

8. Mount Carmel House Treatment Centre Inc.
R.R. #2
Williamstown, Ontario K0C 2J0
(E) Toxicomanie et alco

9. Hôpital Laurentien
41 Ramsey Lake Road
Sudbury, Ontario P3E 5J1

SECTEUR manufacturier

1. Dominion Yarn Co.
R.R. #1
Long Sault, Ontario K0G 1P0
(P) Textile

2. Champlain Ind.
C.P. 189
Cornwall, Ontario K6H 5S7
(E) Industrie laitière

3. C - Tech Ltd.
C.P. 1960
Cornwall, Ontario K6H 6N7
(E) Usine d'outillages électroniques

4. Glassec
3320 rue Loyalist
Cornwall, Ontario
(P) Manufacture de verre trempé/verre isolant

5. Mobern Inc.
C.P. 1207
80 rue Boundary
Cornwall, Ontario K6H 5V3
(B) Usine de vinyle

6. Servaas Rubber Canada Inc.
600 rue Campbell
Cornwall, Ontario K6H 5T1
(B) Industrie du recyclage du caoutchove

7. Morewood Industries
C.P. 10
Morewood, Ontario K0A 2R0
(P) Fabricant de maison (modular) fenêtres et cuisines

SECTEUR ressources naturelles/services publics

1. Malette Waferboard Co.
Highway 101 W.C.P. 1100
Timmins, Ontario P4N 7H9
(P) Production de panneaux de meuble et de construction

2. Bio Shell Inc.
Chemin de la Petite Gasperu
C.P. 547
Hearst, Ontario
(E) Fabrication de granules énergétique

SECTEUR Resources Naturelles/Services Publics (cont'd)

3. Belmoral Mines Ltd.
Buffalo Ankerite Minesite
P.O. Box 968
Schmacher, Ontario P9N 1G0
(E) minière

4. I.C.G. Utilities
Bag 2005
615 Moneta Avenue
Timmins, Ontario P4N 7X4
(E) Entre de gaz naturel

SECTEUR de Services/Hôtellerie

1. J.B. Bergeron & Sons Ltd. Assurance
154 3e avenue
Timmins, Ontario P4N 1C5
(E) assurance générale

2. Hygraders Steakhouse
29 sud, rue Spruce
C.P. 194
Schumacher, Ontario P0N 2G0

3. Centre Culturel La Ronce Inc.
32 Nord, rue Mountjoy
Timmins, Ontario P4N 4V6
(E) Centre culturel

4. La Chaumière
32 nord, rue Mountjoy
Timmins, Ontario
(E) Restaurant

5. Racicot - Bonnery - Aubé - Gauthier
15 Balsam sud
Timmins, Ontario P4N 2C7
(E) Bureau d'avocate

6. Chateauké
32 nord, rue Mountjoy
Timmins, Ontario P4N 4V6
(E) Salon de beauté

7. Hebdo Le Voyageur
1314 boul. La Salle
Sudbury, Ontario P3A 1Y8
(E) journal hebdomadaire francophone

SECTEUR du Transport

1. Administration de la Voie Maritime
du St. Laurent
202 rue Pitt
Cornwall, Ontario K6J 3P7
(E) Transport Naval

2. Courrier Purolator Limitée
725 Ch. Boundary
Cornwall, Ontario K6H 3Z2
(E) Mwssagérie

3. Travelway Ltd.
120 Ouest rue Tollgate
Cornwall, Ontario K6J 5M3
(E) Transport - autobus scolaires

4. Cornwall Provincial Ambulance
850 McConnell Ave.
Cornwall, Ontario K6H 4M3
(E) Ambulance

5. Veteran's Modern Cab
120 Ouest rue Tollgate
Cornwall, Ontario
(E) Taxi

6. Motorways
rue Tollgate
R.R. #2
Cornwall, Ontario K6H 5R6
(E) livraison de marchandises

7. Manitoulin Transport
Highway 11 East C.P. 340
Hearst, Ontario P9L 1N0
(E) Transport

SECTEUR de Ventes (en gros et au détail)

1. Centre de Cuisine de Cornwall
123 Chemin Cornwall Centre
Cornwall, Ontario K5K 1K6
(E) vente de meubles de cuisine, tapis

2. Glen Vending Ltd.
3300 est rue deuxiéme
Cornwall, Ontario K6H 5T2
(E) distribution de nourriture

SECTEUR de Ventes (en gros et au détail) (continued)

3. Brunet Bros. Ltd.
1525 rue Pitt
Cornwall, Ontario K6H 5V2
(E) Quincaillerie et materiaux de construction

4. Cornwall Fruit Supply
1424 Lascelle
Cornwall, Ontario
(P) Ventes de nourriture en gros

5. Bellemare Bros. Ltd.
844 rue Sydney
Cornwall, Ontario
(E) Magasin de Fruits et Légumes

6. Poirier Business Machines
575 rue Boundary
Cornwall, Ontario K6H 5T1
(B) Ventes et services d'article de bureau

7. Sears Canada Inc.
1 Water Street East
Cornwall, Ontario K6H 6M2
(B) Retail Department Store

APPENDIX 3

ANGLOPHONE SURVEY RESULTS

OCCUPATIONAL LITERACY:

A TRAINING PROFILE

QUESTIONNAIRE

ACCESS PROGRAMS UNIT
ONTARIO BASIC SKILLS PROGRAM
MINISTRY OF SKILLS DEVELOPMENT

JANUARY 1988

PART A:

The purpose of this questionnaire is to determine the literacy and related competencies which are used in para-professional, skilled, and semi-skilled occupations. Employer interviews are now being conducted across nine occupational sectors to obtain information on generic skills required by their employees. this one hour interview will be complemented with a short tour of the company or organization.

SECTION I: GENERAL INFORMATION

1. College: ____________________

2. Interviewer: ____________________

3. Interview Number: __________

4. Company Name: ____________________

5. Company Address: ____________________

____

____

6. Company Contact: ____________________

7. Type of Business: ____________________

8. Sector

Construction	____
Finance	____
Government/Education	____
Health Care	____
Manufacturing	____
Natural Resources/Utilities	____
Service/Hospitality	____
Transportation	____
Wholesale/Retail	____

9. How many employees does your firm/company regularly employ?

1 - 49	____	200 - 499	____
50 - 99	____	500 - 1000	____
100 - 199	____	1000 +	____

10. What is/are the major language(s) in which business is conducted in your firm/company?

English ____
French ____
Other (Specify) ________________________
____
____

11. A. All organizations require employees with a variety of educational backgrounds. What percentage of your employees would fit into each of the following categories?

Semi-Skilled ____
Skilled ____
Para-Professional ____
TOTAL 100%

B. What are the minimum educational requirements for hiring in your organization/company?

____
____
____
____

12. Please identify three (3) representative positions in each of the preceding levels of job categories.

SEMI-SKILLED ________________________
____
____
____
____

SKILLED ________________________
____
____
____
____

PARA-PROFESSIONAL ________________________
____
____
____
____

SECTION II: COMMUNICATIONS

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
13. Reading:	%	%	%
A. In the work setting of the company or organization are the employees required to read:	N = 218	N = 234	N = 131
- notes	92	97	96
- letters, memos	81	95	96
- work, job or purchase orders	61	92	92
- vouchers, claims	43	86	86
- schedules, charts, or single column tables	61	91	96
- policy manuals, regulations and instructions	60	92	97
- reports	40	81	92
B. In the employees' work reading are they required to:			
- determine facts	69	93	97
- determine opinions, purposes or implied meanings	36	82	90
- compare a given selection with a previous one	35	80	91
- compare references from two or more sources and make a judgement on the one to use	22	70	91
C. Do employees gather information from references such as:			
- Telephone Directories	49	78	83
- Catalogues	30	76	82
- Dictionaries	19	67	79
- Technical References	23	78	84
- Company Manuals	48	83	90
- Computer Screens	22	67	71
- Microfiches	10	40	41
- Other (Specify)			

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
13. Reading (Cont'd):	%	%	%
D. Are employees required to sort and file, or store forms such as:			
- correspondence	33	77	80
- vouchers, invoices or expenditures	32	78	78
- parts or tools	53	76	70
14. Writing:			
A. In the work setting of the company or organization are the employees required to write:			
- short notes	77	92	95
- internal memos	32	79	89
- external letters	10	61	81
- form letters	11	60	74
- reports	22	65	88
- estimates	13	58	82
- single paragraph letters	17	63	86
B. Are employees required to fill in or to complete forms using:			
- figures	73	94	95
- short phrases	63	87	95
- sentences	43	83	93
- paragraphs	26	76	89
C. Do employees prepare reports which require them to:			
- show information	46	84	94
- include suggestions or recommendations	28	73	86
- decide what information is needed to do the job	22	71	89
- decide how to get the information	18	67	88
- analyze information	16	62	84
- evaluate information	13	59	81

	OCCUPATIONAL LEVEL		
14. Writing (Cont'd):	%	%	%
D. Are employees required to:			
- prepare forms to record correspondence, telephone calls or lists of visitors	25	65	73
- prepare sub-headings or breakdowns for expenditures or receipts	10	59	70
- prepare forms to record information they believe others have a need to know	17	65	79
- prepare file systems	12	61	73
15. Other Linguistic Competencies:			
A. Do employees receive oral (word of mouth) information or instructions which require them to:			
- know the facts or directions	95	98	98
- understand opinions, purposes or implied meanings	82	96	97
B. Do employees talk to people in their work by:			
- giving job directions or instructions	59	89	95
- giving information	89	95	97
- obtaining information by asking questions	91	96	95
- making presentations	19		82
- negotiating with fellow workers or customers	47	59	89
- debating with supervisor	67	76	89
- taking part in formal meetings	54	82	89

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
15. Other Linguistic Competencies (Cont'd):	%	%	%
C. If employees use diagnostic skills, do they:			
- list, state or think of possible reasons which might cause certain faults or symptoms	49	86	90
- use reference manuals to guide them in selecting the possible reasons for problems	28	79	87
- establish a priority or sequence in which to check the possible reasons for problems	25	77	86
- personally check to find out which of the possible reasons is the correct one	26	75	83
- use reference manuals to guide them in how to check each reason	21	73	81
D. If employees have to check to find out which of several solutions is the correct one, do they do this by:			
- asking probing questions	63	87	90
- examining by smelling, listening, touching, looking at or tasting	56	77	78
- using tools or instruments	56	78	71

SECTION III: MATHEMATICS

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
16. Mathematics:	%	%	%
In the work setting of the company do employees use:			
A. Whole Numbers			
- count	88	97	96
- add or subtract	85	98	98
- multiply or divide	78	98	98
- round off	70	95	96
B. Fractions			
- add or subtract	43	83	88
- multiply or divide	39	83	89
C. Decimals			
- add or subtract	45	87	86
- multiply or divide	43	86	86
- round off	41	84	86
- use decimals only with respect to dollars and cents	50	76	73
D. Percents			
- calculate % of a number	34	80	91
- calculate % one number is of another	24	75	86
- calculate a number when a % of it is known	24	73	86
E. Equivalents			
- change fractions to decimals or percentages	14	63	77
- change decimals or percentages to fractions	12	62	76
- change decimals to percentages or percentages to decimals	14	64	76

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
17. Is it important for employees to:	%	%	%
- recognize circles, triangles, spheres, rectangles, squares etc.	59	71	72
- recognize common angles such as 15, 30, 45 and 90 degrees	32	61	59
- draw, sketch or form the above mentioned figures	20	57	56
- read scale drawings such as blueprints	12	57	52
- read assembly drawings	14	58	55
- read schematic drawings	11	57	55
- take measurements from scale drawings	11	48	50
- draw to scale	3	40	44
- use graphs	9	50	67
- record information on graphs	8	47	64
- draw graphs	4	42	59
18. Are employees required to:			
A. Estimate:			
- Time (how long it will take to do a job)	56	84	85
- Weight (how much something probably weighs)	52	68	59
- Distance	43	64	61
- Area	30	59	54
- Liquid Volume	30	49	46
- Spatial Volume	28	52	47

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
18. Are employees required to (Cont'd):	%	%	%
B. Measure:			
- Time	68	80	82
- Weight	46	64	56
- Distance	38	60	55
- Area	28	53	50
- Liquid Volume	30	49	41
C. Use the following units of measure:			
- Metric	63	82	84
- Imperial	64	79	81
D. Performing conversions:			
- imperial to metric or the reverse	38	65	74
E. Read scales such as:			
- meters, weight and volume scales, thermometers etc.	58	77	68
19. Are employees required to:			
- solve numerical problems in word form	20	50	63
- use ratio to show comparisons between two numbers	13	54	74
- use proportions to solve problems	12	53	66
- calculate areas, perimeters and volumes	17	51	57
- solve problems algebraically at the one variable level	4	32	42
- write, simplify and solve two variable algebraic problems	2	20	28
- perform geometric calculations	2	26	34
- perform trigonometric calculations	1	19	30

SECTION IV: SCIENCE

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
20. General Science:	%	%	%
In the work setting are employees required to have a knowledge of the basic terms, processes, properties and symbols within these topics:			
- Water	27	50	42
- Matter	13	42	36
- Density	14	43	38
- Levers	21	48	38
- Static Electricity	14	42	36
- Electricity	21	55	41
- Other (Specify)			
21. Biology:			
Are employees required to interpret, apply, analyze and synthesize concepts within these topics:			
- The Cell	1	6	15
- Chemistry of Life (Biology, Matter and Energy and Biological Chemistry)	1	7	18
- Bioenergetics (Chemical Energy for Life, Energy Capture, Energy Release, Energy Utilization)	1	6	15
- Reproduction	0	5	14
- Genetics	2	4	12
- Human Biology	1	8	15
- Ecology	7	12	21
- Other (Specify)			

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
22. Chemistry:	%	%	%
Is it important for employees to have a knowledge of the basic terms, symbols, rules, laws and theories within these topics:			
- Matter	3	15	18
- Atomic Structure	1	11	15
- Periodic Law and Characteristics of the Types of Elements	1	12	17
- Chemical Bonding	1	17	21
- Formulae and Nomenclatures	1	12	20
- Equations and Reactions	1	14	18
- Gases	9	27	30
- Solutions	12	29	32
- Acids and Bases	10	32	31
23. Physics:			
Are employees required to have a knowledge of the basic concepts and laws within these topics:			
- Motion	9	36	28
- Force	9	35	30
- Heat	15	36	33
- Work, Energy, Power	12	33	31
- Wave Motion	4	22	21
- Electricity AC/DC	13	41	34
- Electro-Magnetic Induction	4	29	21
- Electronics	4	30	28
- Nuclear Energy	1	10	13

SECTION VI: COMPUTER LITERACY

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
24. In which of the following ways are computers used by your employees:	%	%	%
- Clerical Functions WP/Electronic Mail	24	65	56
- Payroll/Accounts	17	59	47
- Data Collection & Analysis	16	65	58
- Inventory Analysis	15	53	51
- Operational Planning Budgeting/Forecasting	4	39	44
- Monitoring & Controlling of Production Equipment (CAD/CAM)	5	18	24
- Equipment Design & Testing	1	14	21
25. What plans do you have to further computerize your company?			
- Clerical Functions	21	50	47
- Payroll/Accounts	12	42	41
- Data Collection & Analysis	16	47	45
- Inventory Control	19	49	46
- Operational Planning	9	38	44
- Monitoring & Control of Production Equipment	8	30	28
- Equipment Design & Testing	3	14	15
26. Do you consider some degree of computer literacy for new employees to be			
- Unnecessary?	37	13	8
- Optional?	12	9	2
- Advantageous?	35	50	47
- Essential?	5	29	40

N = 264

%

27. Does your company have a main frame? Yes _54_ No _____

28. Does your company use a network system? Yes _52__ No _____

29. Does your company have desk top publishing? Yes _90__ No _____

30. Which of the following software packages are used by your company?

Autocad	Yes	_10__	No	_____
D-Base II/III	Yes	_32__	No	_____
Lotus	Yes	_46__	No	_____
PC-DOS	Yes	_47__	No	_____
Word Perfect	Yes	_28__	No	_____
WordStar	Yes	_19__	No	_____

Other (Specify) ______________________________

____

____

31. What microcomputer equipment is/are used in your company?

Apple	_11__	Tandy	__2__
Compaq	_13__	Wang	__8__
IBM	_40__	Xerox	__9__
IBM Compatibles	_22__		

Other (Specify) ______________________________

____

____

SECTION VII: WORK ADJUSTMENT SKILLS

OCCUPATIONAL LEVEL

	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
32. In the work setting are employees required to be aware of:	%	%	%
- company policies and practices	95	97	97
- employer/employee expectations	97	97	96
33. Is it important for employees to develop:			
- positive communication skills for personal use in the work place (polite, assertive)	97	98	99
- proper attitudes and motivation necessary to succeed on the job (dress, co-operative, punctual)	99	99	99
- skills required to advance in the job	85	94	96
- time management skills	85	94	99
- decision making skills	79	95	99
34. Is it important for employees to know how to use the skills of:			
- following instructions	99	99	99
- giving feedback	97	98	99
- working with supervisors and co-workers	99	99	99
- sticking to a schedule	98	99	98
- showing initiative	95	98	99

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
35. Are employees required to have knowledge of:	%	%	%
- basic work place hazards	94	92	89
- first aid	54	61	57
- basic legal rights and responsibilities of the job	68	77	81
- standard safe work practices	93	91	86
- provisions of the Occupational Health and Safety Act	66	72	70
- provisions of the Workers Compensation Act	61	69	71
36. In your opinion, is it important for employees to be aware of the following topics:			
- care of equipment and materials	97	96	90
- stress management	54	71	79
- community resources	53	67	72
- substance abuse	86	88	88
- personal hygiene	92	93	91
- human rights	83	86	86
- stereotyping	71	78	79
- responding to change	85	91	91
- nutrition	73	74	75
- performance review	81	88	89
- factors contributing to worker satisfaction	86	89	90

SECTION VII: TECHNICAL HANDS-ON

One of the objectives of the Ontario Basic Skills Program is to provide some basic experience of a hands-on nature. The purpose is not to provide skill training, but rather to assist trainees in identifying suitable employment/training objectives, for example, computer programmers, mechanics or typists. In order to assist program deliverers in determining what hands-on training would be of greatest relevance to trainees, could you please identify the tools and equipment used in your operation.

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
37. Hand Tools:	%	%	%
- Brace & Bit	34	50	19
- Chisels	39	57	24
- Drills	43	61	22
- Files	39	61	27
- Hammers	52	64	28
- Levels	37	59	24
- Planes	34	49	18
- Pliers	49	62	29
- Pry Bars	43	59	21
- Ratchets	40	59	24
- Saws	42	61	24
- Screw Drivers	54	66	30
- Socket Sets	44	60	25
- Soldering Tools	36	59	24
- Squares	36	56	21
- Vises & Clamps	40	60	24
- Wrenches	48	62	28
38. Portable Hand Power Tools:			
- Circular Saws	29	50	18
- Drills	36	59	22
- Grinders	33	55	16
- Jigsaws	27	46	15
- Oxy-acetylene Welders	19	50	15
- Sabersaws	25	44	12
- Sanders	31	50	15

	OCCUPATIONAL LEVEL		
	SEMI-SKILLED	SKILLED	PARA PROFESSIONAL
39. Fixed Power Tools:	%	%	%
- Arc Welding	14	45	10
- Band Saw	19	36	8
- Bench Saw	18	37	8
- Drill Press	21	45	11
- Jointer	13	30	6
- Lathe	10	34	5
- MIG/TIG Welding	10	33	8
- Radial Arm Saw	16	32	8
- Router	13	30	8
- Table Saw	18	36	9
40. Measuring Devices:			
- Calipers	14	52	24
- Dial Indicators	22	53	25
- Electronic Gauges	23	55	31
- Feeler Gauges	12	49	19
- Gauges	24	53	25
- Micrometers	12	44	21
- Protractors	12	47	28
- Rulers	43	63	50
- Squares	27	53	30
- Tapes	50	68	49
41. Lab Equipment:			
- Balances	9	22	14
- Electroscopes, Voltmeters	6	30	16
- Bunsen burners, test tubes	3	13	11
- Magnets	4	18	9
- Microscopes, slides	3	15	8
- PH Meters	6	18	12
- Volumetric, pipettes, cylinders, flasks	4	19	13

42. Other: ____________________

43. Are there any other literacy and related competencies that are important for employees to have to perform effectively in their work?

APPENDIX 4

FRANCOPHONE SURVEY RESULTS

CONNAISSANCES ET COMPETENCES PROFESSIONNELLES:

QUESTIONNAIRE SUR LA FORMATION

UNITE DES PROGRAMMES D'ACCES
FORMATION DE BASE DE L'ONTARIO
MINISTERE DE LA FORMATION PROFESSIONNELLE

JANVIER 1988

PART A:

L'objectif de ce questionnaire est de déterminer les connaissances et les compétences connexes utilisées dans des postes professionnels, spécialisés et semi-spécialisé. Dans le cadre de ce sondage, des employeurs de neuf différents secteurs seront interviewés afin de déterminer quelles compétences génériques ils recherchent chez leurs employés. L'entrevue d'une heure est ensuite suivie d'une courte visite guidée de l'entreprise ou de l'organisation.

SECTION I: RENSEIGNEMENTS GENERAUX

1. Collège: ____________________

2. Intervieweur: ____________________

3. Entrevue No: __________

4. Nom de l'entreprise: ____________________

5. Adresse de l'entreprise: ____________________
____
____

6. Personne-ressource de l'entreprise: ____________________

7. Genre d'entreprise: ____________________

8. Secteur
de la construction __________
financier __________
de la fonction publique/éducation __________
des soins de la santé __________
manufacturier __________
des ressources naturelles/services publics __________
des services/hôtellerie __________
du transport __________
des ventes (en gros et au détail) __________

9. Combien d'employés travaillent régulièrement dans votre entreprise ou compagnie?

de 1 à 49 __________
de 50 à 99 __________
de 100 à 199 __________
de 200 à 499 __________
de 500 à 1 000 __________
plus de 1 000 __________

10. Quelle(s) est(sont) la(les) langue(s) principale(s) utilisée(s) lors des opérations de votre entreprise ou compagnie?

anglais ____________
français ____________
autres (veuillez préciser) ____________________________
____
____

11. A. Toutes les organisations ont besoin d'employés possédant une formation scolaire différente. Quel pourcentage de vos employés entrent dans chacune des catégories suivantes?

Semi-spécialisé _____
Spécialisé _____
Professionnel _____

TOTAL 100%

B. Quels sont les critères de formation scolaire minimum pour l'embauche d'employés au sein de votre organisation ou entreprise?

____
____
____
____

12. Veuillez identifier trois (3) postes représentatifs dans chacune des catégories précédentes.

SEMI-SPECIALISE ____
____
____
____
____

SPECIALISE ____
____
____
____
____

PROFESSIONNEL ____
____
____
____
____

SECTION II: COMMUNICATION

	NIVEAU PROFESSIONNEL		
13. Lecture:	SEMI-SPECIAL-ISE %	SPECIAL-ISE %	PROFESSIONNEL %
A. Dans le cadre de leur travail, vos employés doivent-ils lire les suivantes?	N = 45	N =54	N =36
- des notes	82	96	97
- des lettres, des notes de service	73	85	97
- des demandes, de services, des offres d'emploi ou des bons de commande	60	78	92
- des bons, des demandes de règlement	33	70	86
- des horaires, des diagrammes ou des tableaux à une seule colonne	58	85	89
- des manuels de politiques, des règlements et des directives	49	80	92
B. De par ces lectures, vos employés doivent-ils:			
- déterminer des faits	51	78	97
- déterminer des opinions, des objectifs ou des significations implicites	42	74	97
- comparer une sélection donnée à une sélection précédente	44	69	94
- comparer les références de deux ouvrages ou plus et choisir laquelle des deux utiliser	27	70	94
C. Vos employés consultent-ils les suivants ?			
- des annuaires téléphoniques	38	80	92
- des catalogues	27	67	78
- des dictionnaires	11	56	83
- des ouvrages de référence techniques	22	70	83
- des manuels de l'entreprise	47	76	89
- des écrans d'ordinateur	7	41	64
- des microfiches	2	24	39
- autres (veuillez préciser)			

13. Lecture(suite):	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
D. Vos employés doivent-ils trier et classer les suivants ?			
- la correspondance	24	65	92
- les pièces compatables, les factures ou les dépenses	18	67	92
- les morceaux ou les outils	58	80	78
14. Rédaction:			
A. Dans le cadre de leur travail, vos employés doivent-ils rédiger les suivants ?			
- de brèves notes	69	96	97
- des notes de service internes	20	59	94
- des lettres externes	7	39	89
- des lettres circulaires	9	37	86
- des rapports	22	61	92
- des devis (estimatifs)	7	37	89
- des lettres à un seul paragraphe	4	44	86
B. Vos employés doivent-ils remplir des formulaires à l'aide des suivants ?			
- des chiffres ou de courtes phrases	60	85	89
- des phrases	33	72	92
- des paragraphes	16	61	89
C. Vos employés préparent-ils des rapports où ils doivent:			
- transmettre de l'information	36	56	86
- faire des suggestions ou des recommandations	24	56	89
- décider quelle information est pertinents au travail	20	54	89
- décider comment se procurer l'information	16	52	83
- analyser l'information	11	44	86
- évaluer l'information	11	39	86

14. Rédactiion(suite):	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
D. Vos employés doivent-ils:			
- préparer les formulaires pour noter la correspondance, les appels téléphoniques ou la liste des visiteurs	16	48	89
- subdiviser les comptes en fonction des dépenses et des reçus	4	37	89
- préparer les formulaires pour y inscrire l'information qu'ils jugent importante	11	44	83
- préparer des systyèmes de classement	9	46	89
15. Autres compétences linguistiques:			
A. Vos employés reçoivent-ils des informations ou des directives orales exigeant:			
- la connaissance des faits et des orientations	93	98	94
- la compréhension des opinions, des objectifs et des significations implicites	82	91	92
B. Dans le cadre de leur travail, vos employés parlent-ils à d'autres personnes pour:			
- leur donner des directives ou des instructions au sujet d'un travail	51	87	92
- leur transmettre des renseignements	78	94	94
- obtenir des renseignements (en leur posant des questions)	80	93	94
- faire des présentations	11	44	72
- négocier avec leurs collègues ou leurs clients	33	61	86
- discuter avec leur surveillant	82	93	92
- prendre part à des réunions formelles	67	83	86

15. Autres compétences linguistiques (suite):	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
C. Si vos employés utilisent des compétences diagnostiques, doivent-ils faire les suivants ?			
- dresser la liste, énoncer ou penser aux raisons possibles qui peuvent entraîner certaines erreurs ou symptômes	49	83	92
- utiliser des ouvrages de référence pour les aider à choisir les causes possibles des problèmes	27	67	92
- établir la priorité ou l'ordre dans laquelle ils doivent vérifier les causes possibles des problèmes	24	65	92
- vérifier personnellement laquelle des causes est la bonne	27	69	86
- utiliser des ouvrages de référence afin de savoir comment vérifier chacune des causes	22	59	89
D. Si vos employés doivent vérifier et trouver laquelle des diverses solutions est la bonne, doivent-ils le faire:			
- en posant des questions?	76	89	92
- en sentant, en touchant, en regardent ou en goûtant?	73	78	81
- à l'aide d'outils ou d'instruments?	56	82	78

16. SECTION III: MATHEMATIQUES

16. Mathématiques:	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
Dans le cadre de leur travail, vos employés utilisent-ils les suivants ?			
A. Nombres entiers			
- compter	89	98	97
- additionner et soustraire	87	98	97
- multiplier et diviser	82	94	97
- arrondir	69	91	97
B. Fractions			
- additionner ou soustraire	49	80	89
- multiplier ou diviser	44	78	86
C. Nombres décimaux			
- additionner ou soustraire	47	78	89
- multiplier ou diviser	40	78	89
- arrondir	40	78	89
- utiliser des décimaux en ce qui a trait à l'argent	47	76	92
D. Pourcentages			
- calculer le % d'un nombre	24	63	92
- calculer le % d'un nombre par rapport à un autre	16	61	92
- calculer un nombre lorsque le % est connu	18	61	92
E. Equivalents			
- changer les fractions en décimaux ou en pourcentages	9	56	86
- changer les décimaux ou les pourcentages en fractions	9	56	86
- changer les décimaux en pourcentages ou les pourcentages en décimaux	7	56	86

17. Est-il important que les employés soient en mesure de/d':	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
- reconnaître des cercles, des triangles, des sphères, des rectangles, des carrés	47	65	58
- reconnaître des angles communs tels que 15, 30, 45 et 90 degrés	42	54	56
- dessiner ou formuler les figures mentionnées si-dessus	27	46	50
- lire des dessins à échelle tels que les bleus	16	48	47
- lire des dessins d'assemblage	29	46	44
- lire des dessins schématiques	16	44	44
- prendre des mesures à partir de dessins à échelle	18	46	53
- dessiner en fonction d'une échelle	2	39	50
- utiliser des graphiques	9	43	64
- inscrire l'information sur les graphiques	4	33	61
- dessiner des graphiques	2	30	61
18. Les employés doivent-ils:			
A. Evaluer:			
- le temps (nécessaire pour faire quelque chose)	56	78	86
- le poids (approximatif de quelque chose)	56	56	72
- la distance	44	56	69
- la superficie	36	46	67
- le volume d'un liquide	31	35	50
- le volume spatial	22	39	64

	SEMI-SPEC-IAL-ISE %	SPEC-IAL-ISE %	PROFES-SIONNEL %
B. Mesurer:			
- le temps	64	87	83
- le poids	42	59	67
- la distance	49	56	64
- la superficie	31	54	58
- le volume d'un liquide	31	52	58
C. Utiliser les unités de mesure suivantes:			
- le système métrique et le système impérial	73	83	83
D. Effectuer la conversion:			
- du système impérial au système métrique ou vice-versa	20	50	69
E. Lire des balances telles que:			
- des appareils de mesure, des décibelmètres, des thermomètres	60	69	78
19. Les employés sont-ils tenus de/d':			
- résoudre des problèmes numériques exprimés en mots	11	44	61
- établir des rapports de comparaison entre deux nombres	13	48	64
- utiliser des proportions pour résoudre des problèmes	16	39	58
- calculer les superficies, les périmètres et les volumes	13	41	61
- résoudre des problèmes algébriques à une seule variable	2	19	39
- écrire, simplifier et résoudre des problèmes algébriques à deux variables	0	9	31
- écrire, simplifier et résoudre des équations du second degré			
- effectuer des calculs géométriques	2	15	28
- effectuer des calculs trigonométriques	2	9	28

SECTION IV: SCIENCES

20. Sciences générales:

Dans le cadre de leur travail, vos employés doivent-ils connaître les termes, les procédés, les propriétés et les symboles de base des sujets suivants ?

	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
- l'eau	16	32	33
- la matière	13	26	28
- la densité	9	28	25
- les leviers	13	30	28
- l'électricité statique	11	26	28
- l'électricité	18	37	31
- autres (veuillez préciser)			

21. Biologie:

Vos employés sont-ils tenus d'interpréter, d'appliquer, d'analyser et de synthétiser les concepts relatifs aux sujets suivants ?

	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
- la cellule	0	7	11
- la chimie de la vie (biologie, matière et énergie, chimie, biologique)	0	6	8
- la bioènergétique (transformations de l'énergie par l'être humain)	0	6	8
- la reproduction	0	6	11
- la génétique	0	6	11
- la biologie humaine	0	7	14
- l'écologie	0	6	11
- autres (veuillez préciser)			

22. Chimie:

Vos employés doivent-ils connaître les termes, les symboles, les règlements, les lois et les théories de base des sujets suivants ?

	SEMI-SPEC-SIAL-ISE %	SPEC-IAL-ISE %	PROFES-SIONNEL %
- la matière	7	13	14
- la structure atomique	4	11	14
- la classification périodique et les caractéristiques des divers éléments	4	11	11
- la liaison chimique	4	13	17
- les formules et les nomenclatures	7	11	14
- les équations et les réactions	2	13	14
- les gas	4	17	14
- les solutions	9	19	14
- les acides et les bases	11	20	19

23. Physique:

Vos employés doivent-ils connaître les concepts et les lois de base des sujets suivants ?

	SEMI-SPEC-SIAL-ISE %	SPEC-IAL-ISE %	PROFES-SIONNEL %
- le mouvement	11	19	17
- la force	9	20	25
- la chaleur	9	24	22
- le travail, l'énergie et la puissance	9	22	25
- le mouvement ondulatoire	2	11	19
- l'électricité AC/DC	11	28	22
- l'induction électro-magnétique	7	17	22
- l'électronique	4	22	22
- l'énergie nucléaire	2	4	11

SECTION VI: CONNAISSANCES INFORMATIQUES

	SEMI-SPECSIALISE %	SPECIALISE %	PROFESSIONNEL %
24. A quelles fins vos employés utilisent-ils les ordinateurs ?			
- le travail de bureau: traitement de texte et courrier électronique	9	41	64
- la pays/la comptabilité	2	32	56
- la collecte et l'analyse des données	7	28	58
- le contrôle des stocks	0	26	53
- la planification des opérations, le budget d'exploitation et les prévisions budgétaires	2	26	50
- la surveillance et le contrôle de l'équipement de production (CAD/CAM)	4	9	28
- la conception et le testing de l'équipement	0	7	19
25. Quels sectuers de votre compagnie aimeriez-vous informatiser d'avantage ?			
- le travail de bureau	4	24	39
- la paye/la comptabilité	4	24	36
- la collecte et l'analyse des données	4	24	42
- le contrôle des stocks	4	24	44
- la planification des opérations	4	24	42
- la surveillance et le contrôle de l'équipement de production	0	9	22
- la conception et le testing de l'équipement	0	4	11
26. A votre avis, une certaine connaissance en informatique chez les nouveaux employés est-elle:			
- inutile ?	40	13	6
- au choix ?	9	9	3
- avantageuse ?	18	28	44
- essentielle ?	2	22	36

N = 58

27. Votre compagnie possède-t-elle un ordinateur central ?
%
Oui_26-45_ Non_______

28. Votre compagnie utilise-t-elle un système de réseau ?
Oui_18-31_ Non_______

29. Votre compagnie possède-t-elle une édition assistée de l'ordinateur (desk top publishing) ?
Oui_24-41_ Non_______

30. Lesquels des logiciels suivants utilisez-vous au sein de votre compagnie ?

Autocad	Oui ___2__	Non ______
D-Base II/III	Oui __19__	Non ______
Lotus	Oui __37__	Non ______
PC-DOS	Oui __32__	Non ______
Word Perfect	Oui __24__	Non ______
WordStar	Oui __14__	Non ______
Autres (veuillez préciser)	______________________	

31. Quel micro-ordinateur utilisez vous au sein de votre compagnie ?

Apple	___7__
Compaq	___5__
IBM	__31__
IBM compatible	__20__
Tandy	___3__
Wang	___2__
Xerox	___2__
Autres (veuillez préciser)	______________________

SECTION VII: COMPETENCES D'ADAPTATION AU TRAVAIL	SEMI-SPECIALISE %	SPECIALISE %	PROFESSIONNEL %
32. Dans le cadre de leur travail, vos employés doivent-ils être au courant des suivants ?			
- les politiques et les pratiques	96	100	97
- les attentes des employeurs/employés	98	98	97
33. Est-il important que vos employés acquièrent les suivants ?			
- de bonnes compétences de communication positive à l'usage personnel pour le milieu du travail (être poli et averti)	93	100	97
- de bonnes attitudes et la motivation nécessaires pour réussir au travail (les vêtements, la collaboration, la ponctualité)	93	100	92
- des compétences d'avancement au travail	82	93	92
- des compétences en gestion de temps	76	91	92
- des compétences en prise de décision	73	93	94
34. Est-il important que vos employés soient en mesure de:			
- suivre des directives	98	100	97
- collaborer et apporter leurs idées	96	98	97
- travailler avec leurs surveillants et leurs collègues	96	98	97
- respecter un horaire	96	98	97
- faire preuve d'initiative	96	98	97

	SEMI-SPEC-SIAL-ISE %	SPEC-IAL-ISE %	PROFES-SIONNEL %
35. Vos employés doivent-ils connaître les suivants ?			
- les risques professionnels de base	84	94	83
- les premiers soins	47	46	33
- leurs responsabilites et leurs droits fondamentaux au travail	73	82	69
- les practiques de la sécurité au travail	82	82	72
- les dispositions de la loi sur la santé et la sécurité au travail	56	67	58
- les dispositions de la Loi sur la Commission des accidents du travail	53	65	64
36. Vos employés doivent-ils être au fait des sujets suivants ?			
- l'entretien de l'équipement et du matériel	93	96	83
- la gestion du stress	42	67	64
- les ressources communautaires	42	50	69
- la toxicomanie et l'alcoolisme	58	67	69
- l'hygiène personnelle	87	87	83
- les droits de la personne	73	76	69
- les stéréotypes	53	59	53
- l'adaptation aux changements	87	89	83
- la nutrition	64	65	61
- l'évaluation du rendement	78	83	72
- les facteurs qui contribuent à la satisfaction professionnelle	91	91	83

SECTION VII: EXPERIENCE TECHNIQUE EN COURS D'EMPLOI

L'un des objectifs du programme de Formation de base de l'Ontario (F.B.O.) est de permettre aux participants d'acquérir de l'expérience practique en cours d'emploi. Il ne s'agit pas de leur offrir une formation de compétences, mais plutôt de leur permettre d'identifier des objectifs de formation et des objectifs professionnels qui soient appropriés (p.ex., programmeurs en informatique, mécaniciens ou dactylos). Afin d'aider les responsables du programme à déterminer quelle formation practique serait la plus pertinente aux stagiaires, nous vous s'aurions gré d'identifier les cutils et l'équipement utilisés au sein de votre entreprise.

37. Outils à main:	SEMI-SPECSIAL-ISE %	SPEC-IAL-ISE %	PROFES-SIONNEL %
- le vilebrequin	36	39	14
- le oiseau à froid	40	48	14
- les forets	44	48	14
- la lime	42	52	19
- le marteau	58	63	19
- le levier	49	46	14
- la varlope	31	43	14
- les pinces	56	50	17
- la barre-levier	47	50	14
- le rochet	44	50	14
- la scie	44	46	14
- le tournevis	58	63	17
- les clés	49	52	17
- les outils de sondage	31	48	17
- l'équerre	38	50	17
- les étaux et les serre-fils	47	50	14
- la clé anglaise	47	50	14
38. Outils électriques à main portatifs:			
- la scie circulaire	38	44	14
- le foret	47	50	14
- le broyeur	42	46	17
- la scie à découper	40	46	14
- la machine à souder à oxyacétylène	24	48	17
- la scie à sabre	27	37	14
- la ponceuse	33	43	11

	SEMI-SPECSIALISE %	SPECIALISE %	PROFESSIONNEL %
39. Outils à main fixes:			
- la soudre à l'arc	13	39	14
- la scie à ruban	24	37	8
- la scie circulaire à table	31	43	17
- la foreuse	33	43	17
- la varlope	22	30	8
- le tour	16	30	8
- la soudre MIG/TIG	16	35	8
- la scie circulaire à bras	31	39	6
- le couteau	22	35	8
- la scie à table	31	41	11
40. Instruments de mesure:			
- les compas	18	43	19
- l'indicateur à cadran	24	44	19
- les calibres électroniques	24	43	19
- les calibres d'épaisseur	20	35	14
- les calibres	31	46	22
- les micromètres	16	33	17
- les règles	40	63	36
- les équerres	42	52	28
- les rubans	33	59	39
41. Equipement de laboratoire:			
- les balances	11	13	14
- les électroscopes, les voltmètres	4	13	17
- les brûleurs, les éprouvettes	7	6	6
- les aimants	4	7	14
- les microscopes, les diapositives	0	7	8
- les compteurs de PH	4	7	11
- les indicateurs de volume, les pipettes, les cylindres, les ballons	4	7	8

42. Autres:

43. Existe-t-il d'autres connaissances et d'autres compétences connexes que vos employés doivent posséder pour bien faire leur travail ?

APPENDIX 5

PROVINCIAL RESULTS

Occupational Level

13	READING	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
A	In the work setting of the company or organization are the employees required to read:						
	- notes	•		•		•	
	- letters, memos	•		•		•	
	- work, job or purchase orders		•	•		•	
	- vouchers, claims			•		•	
	- schedules, charts, or single column tables		•	•		•	
	- policy manuals, regulations and instructions		•	•		•	
	- reports			•		•	
B	In the employees' work reading are they required to:						
	- determine facts		•	•		•	
	- determine opinions, purposes or implied meanings			•		•	
	- compare a given selection with a previous one			•		•	
	- compare references from two or more sources and make a judgement on the one to use				•	•	
C	Do employees gather information from references such as:						
	- telephone directories				•	•	
	- catalogues				•	•	
	- dictionaries				•		•
	- technical references				•	•	
	- company manuals			•		•	
	- computer screens				•		•
	- microfiches						
	- other (specify)						
D	Are employees required to sort and file, or store forms such as:						
	- correspondence				•	•	
	- vouchers, invoices or expenditures				•		•
	- parts or tools		•		•		•

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Occupational Level

14	WRITING	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
A	In the work setting of the company or organization are the employees required to write:						
	- short notes		*	*		*	
	- internal memos				*	*	
	- external letters				*	*	
	- form letters				*		*
	- reports				*	*	
	- estimates				*	*	
	- single paragraph letters				*	*	
B	Are employees required to fill in or to complete forms using:						
	- figures		*	*		*	
	- short phrases		*	*		*	
	- sentences			*		*	
	- paragraphs				*	*	
C	Do employees prepare reports which require them to:						
	- show information			*		*	
	- include suggestions or recommendations				*	*	
	- decide what information is needed to do the job				*	*	
	- decide how to get the information				*	*	
	- analyze information				*	*	
	- evaluate information					*	
D	Are employees required to:						
	- prepare forms to record correspondence, telephone calls or lists of visitors				*		*
	- prepare sub-headings or break-downs for expenditures or receipts				*		*
	- prepare forms to record information they believe others have a need to know				*		*
	- prepare file systems				*		*

Occupational Level

15	OTHER LINGUISTIC COMPETENCE	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
A	Do employees receive oral (word of mouth) information or instructions which require them to:						
	- know the facts or directions	*		*		*	
	- understand opinions, purposes or implied meanings	*		*		*	
B	Do employees talk to people in their work by:						
	- giving job directions or instructions		*	*		*	
	- giving information	*		*		*	
	- obtaining information by asking questions	*		*		*	
	- making presentations				*	*	
	- negotiating with fellow workers or customers				*	*	
	- debating with supervisor		*		*	*	
	- taking part in formal meetings		*	*		*	
C	If employees use diagnostic skills, do they:						
	- list, state or think of possible reasons which might cause certain faults or symptoms			*		*	
	- use reference manuals to guide them in selecting the possible reasons for problems				*	*	
	- establish a priority or sequence in which to check the possible reasons for problems				*	*	
	- personally check to find out which of the possible reasons is the correct one				*	*	
	- use reference manuals to guide them in how to check each reason				*	*	
D	If employees have to check to find out which of several solutions is the correct one, do they do this by:						
	- asking probing questions		*	*		*	
	- examining by smelling, listening, touching, looking at or tasting		*		*		*
	- using tools or instruments		*		*		*

Occupational Level

	MATHEMATICS	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	69-30	<80	79-50	69-30	<80	79-50	69-30
16	In the work setting of the company do employees use:									
A	Whole Numbers									
	- count	●			●			●		
	- add or subtract	●			●			●		
	- multiply or divide		●		●			●		
	- round off		●		●			●		
B	Fractions									
	- add or subtract			●	●			●		
	- multiply or divide			●	●			●		
C	Decimals									
	- add or subtract			●	●			●		
	- multiply or divide			●	●			●		
	- round off			●	●			●		
	- use decimals only with respect to dollars and cents		●			●			●	
D	Percents									
	- calculate % of a number			●	●			●		
	- calculate % one number is of another					●		●		
	- calculate a number when a % of it is known					●		●		
E	Equivalents									
	- change fractions to decimals or percentages					●			●	
	- change decimals or percentages to fractions					●			●	
	- change decimals to percentages or percentages to decimals					●			●	
17	It is important for employees to:									
	- recognize circles, triangles, spheres, rectangles, squares etc.		●			●			●	
	- recognize common angles such as 15, 30, 45 and 90 degrees			●		●			●	
	- draw, sketch or form the above mentioned figures					●			●	

Occupational Level

	MATHEMATICS	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
	- read scale drawings such as blueprints					●			●	
	- read assembly drawings					●			●	
	- read schematic drawings					●			●	
	- take measurements from scale drawings						●		●	
	- draw to scale						●			
	- use graphs					●			●	
	- record information on graphs						●		●	
	- draw graphs						●		●	
18	Are employees required to:									
A	Estimate:									
	- time (how long it will take to do a job)		●		●			●		
	- weight (how much something probably weighs)		●			●			●	
	- distance			●		●			●	
	- area			●		●			●	
	- liquid volume			●			●			●
	- spatial volume					●				●
B	Measure:									
	- time		●		●			●		
	- weight			●		●			●	
	- distance			●		●			●	
	- area					●			●	
	- liquid volume			●			●			●
C	Use the following units of measure:									
	- Metric		●		●			●		
	- Imperial		●		●			●		
D	Performing conversions:									
	- imperial to metric or the reverse			●		●			●	
E	Read scales such as:									
	- meters, weight and volume scales, thermometers, etc.		●			●			●	

OCCUPATIONAL LITERACY SURVEY

PROVINCIAL RESULTS

	MATHEMATICS	Occupational Level Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
19	Are employees required to:									
	- solve numerical problems in word form					●			●	
	- use ratio to show comparisons between two numbers					●			●	
	- use proportions to solve problems					●			●	
	- calculate areas, perimeters and volumes					●			●	
	- solve problems algebraically at the one variable level						●			●
	- write, simplify and solve two variables algebraic problems									
	- perform geometric calculations									●
	- perform trigonometric calculations									●

Occupational Level

	SCIENCE	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
20	**General Science:**									
	In the work setting are employees required to have a knowledge of the basic terms, processes, properties and symbols within these topics:									
	- water					•				•
	- matter						•			•
	- density						•			•
	- levers						•			•
	- static electricity						•			•
	- electricity					•				•
	- other (specify)									
21	**Biology:**									
	Are employees required to interpret, apply, analyze and synthesize concepts within these topics:									
	- the cell									
	- chemistry of life (biology, matter and energy and biological chemistry)									
	- bioenergetics (chemical energy for life, energy capture, energy release, energy utilization)									
	- reproduction									
	- genetics									
	- human biology									
	- ecology									
	- other (specify)									
22	**Chemistry:**									
	Is it important foe employees to have a knowledge of the basic terms, symbols, rules, laws and theories within these topics:									
	- matter									
	- atomic structure									
	- periodic law and characteristics of the types of elements									

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Occupational Level

	% SCIENCE	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
	- chemical bonding									
	- formulae and nomenclatures									
	- equations and reactions									
	- gases									•
	- solutions									•
	- acids and bases						•			•
23	Physics:									
	Are employees required to have a knowledge of the basic concepts and laws within these topics:									
	- motion						•			
	- force						•			•
	- heat						•			•
	- work, energy, power						•			•
	- wave motion									
	- electricity AC/DC						•			•
	- electro-magnetic induction									
	- electronics						•			
	- nuclear energy									

Occupational Level

	COMPUTER LITERACY	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
24	In which of the following ways are computers used by your employees:						
	- clerical functions wp/electronic mail				•		•
	- payroll/accounts				•		
	- data collection & analysis				•		•
	- inventory analysis				•		•
	- operational planning budgeting/ forecasting						
	- monitoring & controlling of production equipment (CAD/CAM)						
	- equipment design & testing						
25	What plans do you have to further computerize your company?						
	- clerical functions				•		
	- payroll/accounts						
	- data collection & alalysis						
	- inventory control						
	- operational planning						
	- monitoring & control of production equipment						
	- equipment design & testing						
26	Do you condider some degree of computer literacy for new employees to be?						
	- unnecessary						
	- optional						
	- advantageous				•	•	
	- essential				•	•	

Occupational Level

	WORK ADJUSTMENT SKILLS	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
32	In the work setting are employees required to be aware of:						
	- company policies and practices	•		•		•	
	- employer/employee expectations	•		•		•	
33	It is important for employee to develop:						
	- positive communciation skills for personal use in the work place (polite, assertive)	•		•		•	
	- proper attitudes and motivation necessary to suceed on-the-job (dress, co-operative, punctual)	•		•		•	
	- skills required to advance in the job	•		•		•	
	- time management skills	•		•		•	
	- decision making skills		•	•		•	
34	Is it important for employees to know how to use the skills of:						
	- following instructions	•		•		•	
	- giving feedback	•		•		•	
	- working with supervisors and co-workers	•		•		•	
	- sticking to a schedule	•		•		•	
	- showing initiative	•		•		•	
35	Are employees required to have knowledge of:						
	- basic work place hazards	•		•		•	
	- first aid		•		•		•
	- basic legal rights and responsibilities of the job		•		•	•	
	- standard safe work practices	•		•		•	
	- provisions of the Occupational Health & Safety Act		•		•		•
	- provisions of the Workers Compensation Act		•		•		•

Occupational Level

	WORK ADJUSTMENT SKILLS	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
36	In your opinion, is it important for employees to be aware of the following topics:						
	- care of equipment and materials	*		*		*	
	- stress management		*		*		*
	- community resources		*		*		*
	- substance abuse	*		*		*	
	- personal hygiene	*		*		*	
	- human rights	*		*		*	
	- stereotyping		*		*		*
	- responding to change	*		*		*	
	- nutrition		*		*		*
	- performance review	*		*		*	
	- factors contributing to worker satisfaction	*		*		*	

Occupational Level

	TECHNICAL HANDS-ON	Semiskilled		Skilled		Paraprofessionl	
		<80	79-50	<80	79-50	<80	79-50
37	Hand Tools						
	- brace & bit			•			
	- chisels			•			
	- drills			•			
	- files			•			
	- hammers		•	•			
	- levels			•			
	- planes						
	- pliers		•	•			
	- pry bars			•			
	- ratchets			•			
	- saws			•			
	- screw drivers		•	•			
	- socket sets			•			
	- soldering tools			•			
	- sqaures			•			
	- vises & clamps			•			
	- wrenches		•	•			
38	Portable Hand Power Tools:						
	- circular saws			•			
	- drills			•			
	- grinders			•			
	- jigsaws						
	- oxy-acetylene welders			•			
	- sabersaws						
	- sanders			•			
39	Fixed Power Tools:						
	- arc welding						
	- band saw						
	- bench saw						
	- drill press						
	- jointer						
	- lathe						
	- MIG/TIG welding						
	- radial arm saw						
	- router						
	- table saw						

Occupational Level

	TECHNICAL HANDS-ON	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
40	Measuring Devices:						
	- calipers				•		
	- dial indicators				•		
	- electronic guages				•		
	- feeler gauges				•		
	- gauges				•		
	- micrometers						
	- protrators				•		
	- rulers				•		•
	- squares				•		
	- tapes				•		•
41	Lab Equipment:						
	- balances						
	- electroscopes, voltmeters						
	- bunsen burners, test tubes						
	- magnets						
	- microscopes, slides						
	- PH meters						
	- volumetric, pipettes, cylinders, flasks						/
42	Other:						

APPENDIX 6

REGIONAL RESULTS

Occupational level

13	Reading	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
A	In the work setting of the company or organization are the employees required to read:						
	- notes	cenw		cenw		cenw	
	- letters, memos	en	c w	cenw		cenw	
	- work, job or purchase orders		cenw	cenw		cenw	
	- vouchers, claims			cen		cen	
	- schedules, charts, or single column tables		en	cenw		cenw	
	- policy manuals, regulations and instructions		enw	cenw		cenw	
	- reports		n	en	c w	cenw	
B	In the employees' work reading are they required to:						
	- determine facts		cenw	cenw		cenw	
	- determine opinions, purposes or implied meanings			en	c w	cenw	
	- compare a given selection with a previous one			en	c w	cenw	
	- compare references from two or more sources and make a judgement on the one to use			e	c nw	cenw	
C	Do employees gather information from references such as:						
	- telephone directories		en	cen	w	cen	w
	- catalogues			c n	e w	c nw	e
	- dictionaries			c	en	c n	e w
	- technical references			n	ce w	cenw	
	- company manuals		n	en	c w	cenw	
	- computer screens			n	ce	n	ce w
	- microfiches				c		c n
	- other (specify)				c		
D	Are employees required to sort and file, or store forms such as:						
	- correspondence			en	c w	c n	e w
	- vouchers, invoices or expenditures			cen	w	c n	e w
	- parts or tools		c n	c n	e w		cenw

c - central e - east n - north w - west

Occupational level

14	Writing	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
A	In the work setting of the company or organization are the employees required to write:						
	- short notes	n	ce w	cenw		cenw	
	- internal memos			c n	e w	cenw	
	- external letters				cen	c n	e w
	- form letters			n	ce	c n	e w
	- reports			n	ce	cenw	
	- estimates				cen	c n	e w
	- single paragraph letters				cen	c nw	e
B	Are employees required to fill in or to complete forms using:						
	- figures	c	enw	cenw		cenw	
	- short phrases		cen	cenw		cenw	
	- sentences		n	cen	w	cenw	
	- paragraphs			n	ce w	cenw	
C	Do employees prepare reports which require them to:						
	- show information	n	c	cen	w	enw	
	- include suggestions or recommendations			n	ce w	c nw	e
	- decide what information is needed to do the job			n	ce w	cenw	
	- decide how to get the information			n	ce w	cenw	
	- analyze information				cenw	cen	w
	- evaluate information				enw	c n	e w
D	Are employees required to:						
	- prepare forms to record correspondence, telephone calls or lists of visitors			n	ce	c	enw
	- prepare sub-headings or break-downs for expenditures or receipts			n	ce	c n	e w
	- prepare forms to record information they believe others have a need to know			n	ce	c n	e w
	- prepare file systems			n	ce	c n	e w

c - central e - east n - north w - west

Occupational Level

15	Other Linguistic Competencies	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
A	Do employees receive oral (word of mouth) information or instructions which require them to:						
	- know the facts or directions	cenw		cnw		cenw	
	- understand opinions, purposes or implied meanings	en	c w	cnw		cenw	
B	Do employees talk to people in their work by:						
	- giving job directions or instructions		cen	cnw		cenw	
	- giving information	cenw		cnw		cenw	
	- obtaining information by asking questions	cenw		cnw		cenw	
	- making presentations				cen	cen	w
	- negotiating with fellow workers or customers		en	n	ce w	cenw	
	- debating with supervisor	n	ce w	nw	ce	cenw	
	- taking part in formal meetings		en	nw	c	cenw	
C	If employees use diagnostic skills, do they:						
	- list, state or think of possible reasons which might cause certain faults or symptoms		en	cnw	e	cenw	
	- use reference manuals to guide them in selecting the possible reasons for problems			cn	e w	cenw	
	- establish a priority or sequence in which to check the possible reasons for problems			n	ce w	cenw	
	- personally check to find out which of the possible reasons is the correct one			n	ce w	cen	w
	- use reference manuals to guide them in how to check each reason			n	ce w	cen	w
D	If employees have to check to find out which of several solutions is the correct one, do they do this by:						
	- asking probing questions	n	e	cnw		enw c	
	- examining by smelling, listening, touching, looking at or tasting		en		cenw	ce	nw
	- using tools or instruments		en	cn	e w	e	cnw

c - cantre e - east n - north w - west

Occupational Level

	Mathematics	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
16	In the work setting of the company do employees use:									
A	Whole Numbers									
	- count	cenw			cenw			cenw		
	- add or subtract	cenw			cenw			cenw		
	- multiply or divide	nw	ce		cenw			cenw		
	- round off	w	cen		cenw			cenw		
B	Fractions									
	- add or subtract			cenw	c n	e w		c nw	e	
	- multiply or divide			cenw	c n	e w		cenw		
C	Decimals									
	- add or subtract		n	ce w	c nw	e		cen	w	
	- multiply or divide		n	ce w	c nw	e		cen	w	
	- round off		n	ce w	c nw	e		cen	w	
	- use decimals only with respect to dollars and cents		en	c w	c n	e	w	c n	ew	
D	Percents									
	- calculate % of a number			c nw	c n	e	w	c nw	e	
	- calculate % one number is of another			n	c n	e	w	c nw	e	
	- calculate a number when a % of it is known			n	c n	e	w	c nw	e	
E	Equivalents									
	- change fractions to decimals or percentages		w	n	n	c	e	c nw	e	
	- change decimals or percentages to fractions			nw		c n	e	c nw	e	
	- change decimals to percentages or percentages to decimals				n	c	ew	c nw	e	
17	It is important for employees to:									
	- recognize circles, triangles, spheres, rectangles, squares etc.	e	c			cen	w	c nw	e	
	- recognize common angles such as 15, 30, 45 and 90 degrees			c		c n	ew	n	c w	e
	- draw, sketch or form the above mentioned figures					c n	ew	n	c w	e

c - central e - east n - north w - west

Occupational Level

	Mathematics	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
	- read scale drawings such as blueprints					c nw	e		c nw	e
	- read assembly drawings					cenw			c w	en
	- read schematic drawings					cenw			c w	en
	- take measurements from scale drawings					cen	w		n c	e w
	- draw to scale					en	c w		c n	e w
	- use graphs					cen	w	c	enw	
	- record information on graphs					cen		c	en	w
	- draw graphs					cen		c	n	e w
18	Are employees required to:									
A	Estimate:									
	- time (how long it will take to do a job)		cen	w	cen	w		cenw		
	- weight (how much something probably weighs)		cen	w		cenw			cenw	
	- distance		n	ce w		c nw	e		cenw	
	- area			en		cenw			c nw	e
	- liquid volume			en		cen	w		cen	w
	- spatial volume			en		c n	ew		c	enw
B	Measure:									
	- time	n	ce w		n	ce w		c nw	e	
	- weight		cen			cenw			cen	w
	- distance			cen		cenw			c nw	e
	- area			n		c n	ew		c n	e w
	- liquid volume			n		cen	w			cenw
C	Use the following units of measure:									
	- metric		cen	w	cen	w		cen	w	
	- imperial		cenw		c	enw		c w	en	
D	Performing conversions:									
	- imperial to metric or the reverse		n	ce		w cen		c n	e w	
E	Read scales such as:									
	- meters, weight and volume scales, thermometers, etc.		cen	w	c n	e w			cenw	

c - central e - east n - north w - west

Occupational Level

	Mathematics	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
19	Are employees required to:									
	- solve numerical problems in word form					cn	e	c	en	w
	- use ratio to show comparisons between two numbers					cn	e w	cn	e w	
	- use proportions to solve problems					cn	e w	cn	w	e
	- calculate areas, perimeters and volumes					cnw	e		c nw	e
	- solve problems algebraically at the one variable level					n	c		c n	w
	- write, simplify and solve two variables algebraic problems						n			c n
	- perform geometric calculations						n			c nw
	- perform trigonmetric calculations						n			c nw

c - central e - east n - north w - west

Occupational Level

	Science	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
20	**General Science:**									
	In the work setting are employees required to have a knowledge of the basic terms, processes, properties and symbols within these topics:									
	- water					nw	ce			cenw
	- matter						cenw			cenw
	- density			w		n	ce w			c nw
	- levers					cnw	e			c nw
	- static electricity						cenw			c nw
	- electricity					cn	e w		cn	e w
	- other (specify)									
21	**Biology:**									
	Are employees required to interpret, apply, analyze and synthesize concepts within these topics:									
	- the cell									
	- chemistry of life (biology, matter and energy and biological chemistry)									
	- bioenergetics (chemical energy for life, energy capture, energy release, energy utilization)									
	- reproduction									
	- genetics									
	- human biology									
	- ecology									c
	- other (specify)									
22	**Chemistry:**									
	Is it important foe employees to have a knowledge of the basic terms, symbols, rules, laws and theories within these topics:									
	- matter									
	- atomic structure									
	- periodic law and characteristics of the types of elements									

c - central e - east n - north w - west

Occupational Level

	Science	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
	- chemical bonding									c
	- formulae and momenclatures									
	- equations and reactions									
	- gases						w			cn
	- solutions						nw			c w
	- acids and bases						c n			c
23	Physics:									
	Are employees required to have a knowledge of the basic concepts and laws within these topics:									
	- motion						nw			nw
	- force						c nw			cnw
	- heat						enw			cnw
	- work, energy, power						nw			cnw
	- wave motion						n			
	- electricity AC/DC						c nw			cnw
	- electro-magnetic induction						nw			w
	- electronics						n			n
	- nuclear energy									c

c - central e - east n - north w - west

Occupational level

	Computer Literacy	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
24	In which of the following ways are computers used by your employees:						
	- clerical functions wp/electronic mail			n	ce	n	c w
	- payroll/accounts				cen		c n
	- data collection & analysis			n	ce		c
	- inventory analysis				c n	n	c
	- operational planning budgeting/ forecasting				n	n	c n
	- monitoring & controlling of production equipment (CAD/CAM)						
	- equipment design & testing						
25	What plans do you have to further computerize your company?						
	- clerical functions				c n		w
	- payroll/accounts				n		
	- data collection & analysis				n		w
	- inventory control				c n		c w
	- operational planning						c
	- monitoring & control of production equipment						
	- equipment design & testing						
26	Do you consider some degree of computer literacy for new employees to be?						
	- unnecessary						
	- optional						
	- advantageous				c		
	- essential				e		cenw

c - central e - east n - north w - west

Occupational Level

	Work Adjustment Skills	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
32	In the work setting are employees required to be aware of:						
	- company policies and practices	cenw		cenw		cenw	
	- employer/employee expectations	cenw		cenw		cenw	
33	Is it important for employees to develop:						
	- positive communication skills for personal use in the work place (polite, assertive)	cenw		cenw		cenw	
	- proper attitudes and motivation necessary to suceed on-the-job (dress, co-operative, punctual)	cenw		cenw		cenw	
	- skills required to advance in the job	cenw		cenw		cenw	
	- time management skills	enw	c	cenw		cenw	
	- decision making skills	enw	c	cenw		cenw	
34	Is it important for employees to know how to use the skills of:						
	- following instructions	cenw		cenw		cenw	
	- giving feedback	cenw		cenw		cenw	
	- working with supervisors and co-workers	cen		ce		ce	
	- sticking to a schedule	cenw		cenw		cenw	
	- showing initiative	cenw		cenw		cenw	
35	Are employees required to have knowledge of:						
	- basic work place hazards	cenw		cenw		cenw	
	- first aid		ce		cenw		cen
	- basic legal rights and responsibilities of the job	n	cew	n	ce w	c w	en
	- standard safe work practices	cenw		cenw		ce w	en
	- provisions of the Occupational Health & Safety Act	n	c w	n	ce w		cenw
	- provisions of the Workers Compensation Act		ew		cenw		cenw

c - central e - east n - north w - west

Occupational level

	Work Adjustment Skills	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
36	In your opinion, is it important for employees to be aware of the following topics:						
	- care of equipment and materials	cenw		cenw		cenw	
	- stress management		cen	n	ce	cen	w
	- community resources		cen	n	ce	c	enw
	- substance abuse	c nw	e	cenw		cenw	
	- personal hygiene	cenw		cenw		cenw	
	- human rights	c n	e w	cen	w	cen	w
	- stereotyping	n	ce w	en	c w	c n	e w
	- responding to change	cen	w	cenw		cenw	
	- nutrition	n	ce w	c n	ew	c n	e w
	- performance review	c nw	e	cenw		cenw	
	- factors contributing to worker satisfaction	cenw		cenw		cenw	

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		Occupational level					
	Technical Hands-on	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
37	**Hand Tools**						
	- brace & bit		n		c nw		
	- chisels		n		c nw		
	- drills		n		c nw		
	- files		n		c nw		
	- hammers		cn		cenw		
	- levels		n		c n		
	- planes		n		c nw		
	- pliers		cn		c nw		
	- pry bars		n		c nw		
	- ratchets		n		c nw		
	- saws		n		c nw		
	- screw drivers	w	cn		cenw		
	- socket sets		n		c nw		
	- soldering tools		n		c nw		
	- sqaures		n		c nw		
	- vises & clamps		n		c nw		
	- wrenches		cn		c nw		
38	**Portable Hand Power Tools:**						
	- circular saws				nw		
	- drills				c nw		
	- grinders				c nw		
	- jigsaws				c		
	- oxy-acetylene welders				c nw		
	- sabersaws						
	- sanders				c w		
39	**Fixed Power Tools:**						
	- arc welding				w		
	- band saw						
	- bench saw						
	- drill press				c w		
	- jointer						
	- lathe						
	- MIG/TIG welding						
	- radial arm saw						
	- router						
	- table saw						

c - central e - east n - north w - west

Occupational level

	Technical Hands-on	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
40	Measuring Devices:						
	- calipers				c nw		
	- dial indicators				c nw		
	- electronic guages				c nw		
	- feeler gauges				c nw		
	- gauges				c nw		
	- micrometers				c		
	- protrators				c nw		
	- rulers		n		cenw		cnw
	- squares				c nw		
	- tapes	c	n		cenw		
41	Lab Equipment:						
	- balances						
	electroscopes, voltmeters						
	- bunsen burners, test tubes						
	magnets						
	- microscopes, slides						
	PH meters						
	- volumetric, pipettes, cylinders, flasks						
42	Other:						

c - central e - east n - north w - west

APPENDIX 7

SECTORAL RESULTS

Occupational Level

13	Reading	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
A	In the work setting of the company or organization are the employees required to read:						
	- notes	mncthHwfe		mncthHwfe		mncthHwfe	
	- letters, memos	Hw	mncth fe	mncthHwfe		mncthHwfe	
	- work, job or purchase orders		n thHwfe	mncthHwfe		mnct Hwfe	h
	- vouchers, claims		wf	hHwfe	mnct	m c hHwfe	n t
	- schedules, charts, or single column tables,		n t Hwfe	f mncthHw e		f mncthHw e	
	- policy manuals, regulations and instructions		n t Hwfe	f mncthHw e		f mncthHw e	
	- reports		Hwfe	Hwfe	mncth	mnc hHwfe	
B	In the employee's work reading are they required to:						
	- determine facts	w e	mncthH f	mncthHwfe		mncthHwfe	
	- determine opinions, purposes or implied meanings		w	n t Hw e	m c h f	n thHwfe	m c
	- compare a given selection with a previous one		w	n t wfe	m c hH	mncth wfe	H
	- compare references from two or more sources and make a judgement on the one to use			n t	m c hHwfe	mncthHwfe	
C	Do employees gather information from references such as:						
	- telephone directories		n t Hwfe	H fe	mncth w	hHwfe	mnct
	- catalogues		w	e	mncthHwf	m c h e	n t Hwf
	- dictionaries		w	e	mnct Hwf	hH fe	mnct w
	- technical references			m h e	n t Hwf	mncth fe	Hw
	- company manuals	H f	mnct	m Hwfe	n th	mncthHwfe	
	- computer screens			wfe	mnct H	f	mncth w e
	- microfiches				fe		n t fe
	- other (specify)						
D	Are employees required to sort and file, or store forms such as:						
	- correspondence		n fe	thHwfe	mnc	cthHwf	mn e
	- vouchers, invoices or expenditures		wf	hHwfe	mnct	cth wf	mn H e
	- parts or tools		mn hH e	m t w	nc hH e		mncthHwf

m - manufacturing n - natural resources c - construction t - transportation
h - hospitality service H - health care w - wholesale & retail f - finance
e - education

Appendix 7

OCCUPATIONAL LITERACY SURVEY

SECTORAL RESULTS

Occupational Level

14	Writing	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
A	In the work setting of the company or organization are the employees required to write:						
	- short notes	ntHe	m c h wf	mncthHwfe		mncthHwfe	
	- internal memos		wf	h w e	mnct H f	mncth wfe	H
	- external letters			h w	H fe	ncth w e	m H f
	- form letters			w e	n hH f	h wf	mnctH e
	- reports			w	mncthH e	mncth wfe	H
	- estimates				nc hHw e	ncth w	m H fe
	- single paragraph letters			h e	n Hwf	ncth wfe	m H
B	Are employees required to fill in or to complete forms using:						
	- figures	mn e	cthHwf	mncthHwfe		mncthHwfe	
	- short pnrases	He	mnct w	mncthHwfe		mncthHwfe	
	- sentences		Hw e	cthHw e	mn f	mncthHwfe	
	- paragraphs			h w e	mnct H f	mncthHw e	f
C	Do employees prepare reports which require them to:						
	- show information	m	t wf	ncthH e	m wf	mncthHwfe	
	- include suggestions or recommendations		t f	t H	mnc h wfe	m cthHw e	n f
	- decide what information is needed to do the job			n hH	m ct wfe	nc hHwfe	m t
	- decide how to get the information			h	mnct Hwfe	mnc hHwfe	t
	- analyze information				mncthHwfe	cth wfe	mn H
	- evaluate information				mncthHwf	c h wfe	mn tH
D	Are employees required to:						
	- prepare forms to record correspondence, telephone calls or lists of visitors			h	mn t Hwfe	h w	m ctH fe
	- prepare sub-headings or break-downs for expenditures or receipts				n th wfe	h w	m ct fe
	- prepare forms to record information they believe others have a need to know			h	n t Hwfe	h wfe	m ctH
	- prepare file systems			hH	n t wfe	hH f	m ct w e

m - manufacturing
h - hospitality service
n - natural resources
H - health care
c - construction
w - wholesale & retail
t - transportation
f - finance

Occupational level

	Technical Hands-on	Semiskilled		Skilled		Paraprof.	
		<80	79-50	<80	79-50	<80	79-50
40	Measuring Devices:						
	- calipers				c nw		
	- dial indicators				c nw		
	- electronic guages				c nw		
	- feeler gauges				c nw		
	- gauges				c nw		
	- micrometers				c		
	- protrators				c nw		
	- rulers		n		cenw		cnw
	- squares				c nw		
	- tapes	c	n		cenw		
41	Lab Equipment:						
	- balances electroscopes, voltmeters						
	- bunsen burners, test tubes magnets						
	- microscopes, slides PH meters						
	- volumetric, pipettes, cylinders, flasks						
42	Other:						

c - central e - east n - north w - west

Occupational Level

15	Other Linguistic Competencies	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
A	Do employees receive oral (word of mouth) information or instructions which require them to:						
	- know the facts or directions	mncthHwfe		mncthHwfe		mncthHwfe	
	- understand opinions, purposes or implied meanings	n thHw	m c fe	mncthHwfe		mncthHwfe	
B	Do employees talk to people in their work by:						
	- giving job directions or instructions		mn thHw	mncthHwfe		mncthHwfe	
	- giving information	mncthHwfe		mncthHwfe		mncthHwfe	
	- obtaining information by asking questions	mncthHwfe		mncthHwfe		mncthHwfe	
	- making presentations			w	mnc hH	hHw e	mnct f
	- negotiating with fellow workers or customers		thHw	h wf	mnct H e	mncth wfe	H
	- debating with supervisor	t	nc hHwf	ncth wf	m H e	mncthHwfe	
	- taking part in formal meetings	H	n th w	ncth w	m H fe	ncthHwfe	m
C	If employees use diagnostic skills, do they:						
	- list, state or think of possible reasons which might cause certain faults or symptoms		nct Hw	mncth e	Hwf	mncth wfe	H
	- use reference manuals to guide them in selecting the possible reasons for problems			mn wfe	cthH	mn thHwfe	c
	- establish a priority or sequence in which to check the possible reasons for problems			mn w	cthH fe	mncth wfe	H
	- personally check to find out which of the possible reasons is the correct one			mn h	ct Hwfe	m th fe	nc Hw
	- use reference manuals to guide them in how to check each reason			e	mncthHwf	hHwfe	mnct
D	If employees have to check to find out which of several solutions is the correct one, do they do this by:						
	- asking probing questions	m Hw	ncth	mncthHwfe		m cthH fe	n w
	- examining by smelling, listening, touching, looking at or tasting	m	ncthHw	mn th	c Hwfe	c hH fe	mn t w
	- using tools or instruments		ncthHw	mn h	ct Hw e	H	mncth wfe

m - manufacturing
n - natural resources
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t - transportation
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H - health care
w - wholesale & retail
f - finance
e - education

Occupational Level

	Mathematics	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
16	In the work setting of the company do employees use:									
A	Whole Numbers									
	- count	mncthHwe	f	w	mncthH fe			mncthHwfe		
	- add or subtract	mnct Hwe	h f	w	mncthH fe			mncthHwfe		
	- multiply or divide	mn t w	c hH fe	w	mncthH fe			mncthHwfe		
	- round off	n t	m c hHwfe	w	mncthH fe			mncthHwfe		
B	Fractions									
	- add or subtract		c wf	mn t Hw e	mnc hH fe	t		mncthHwfe		
	- multiply or divide		n wf	m ct Hw e	mnc hH fe	t		mncthHwfe		
C	Decimals									
	- add or subtract		nct wf	m Hw e	mnc h fe	t H		mnc hHwfe	t	
	- multiply or divide		nc wf	t Hw e	mnc h fe	t H		mnc hHwfe	t	
	round off		n t wf	c w e	mnc h fe	t H		m cthHwfe	n	
	- use decimals only with respect to dollars and cents		n thHwfe	w	hH fe	mnct	h	c h wf	mnt	H e
D	Percents									
	- calculate % of a number		n Hw e	t wfe	c hHwfe	mn t		mnct Hwfe	hH	
	- calculate % one number is of another			n t H fe	wfe	mncthHw		mnct Hwf	hH	
	- calculate a number when a % of it is known			t H fe	w	mncthHwf		mnct Hwf	h	
E	Equivalents									
	- change fractions to decimals or percentages			f	e	mnc hHwf	t	mnc fe	thHw	
	- change decimals or percentages to fractions			f	e	mnc hHwf	t	mnc Hwfe	th	
	- change decimals to percentages or percentages to decimals			t f	e	mncthHwf		mnc fe	hHw	
17	Is it important for employees to:									
	- recognize circles, triangles, spheres, rectangles, squares etc.		mnct H e	h f	m ct w	n hH e	wf	mnc H	th fe	w
	- recognize common angles such as 15, 30, 45 and 90 degrees		m e	n	mnc	t H e	hw	mnc	H e	th f
	- draw, sketch or form the above mentioned figures		e		m c	n t H e	hw	nc	hH e	t f

m - manufacturing n - natural resources c - construction t - transportation h - hospitality service
H - health care w - wholesale & retail f - finance e - education

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Occupational Level

	Mathematics	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
	- read scale drawings such as blueprints				m c	n h e	t Hw	nc	m e	thHwf
	- read assembly drawings				m	ncthH e	Hw	nc	m thH e	wf
	- read schematic drawings				m	ncth e	Hw	n	m cth e	Hwf
	- take measurements from scale drawings					mnc e	thHw		mnct e	hHwf
	- draw to scale					n e	mcthH		nc e	m thHw
	- use graphs					mn h e	ct Hwf	n	m cthHwf	
	- record information on graphs					mn e	cthHwf	e	mncthHwf	
	- draw graphs					n e	mc hHwf	e	ncth wf	m H
						e		e		
18	Are employees required to:									
A	Estimate:									
	- time (how long it will take to do a job)	H	n t wfe	m c h	ncthH fe	m w		ncthH fe	m w	
	- weight (how much something probably weighs)		n t Hwfe	m c h	nc H	m th w e		n H	m c h w	t fe
	- distance		n t H	m c h e	n t	m hH e	c w	nc	m thH e	wf
	- area		n	ct H e	n	m thH e	c w	nc	hH e	m t w
	- liquid volume		H	th e	H	n th	mc e		n hH	mc w e
	- spatial volume		t	H e	H	mn th	c w n		nc hH	m t w e
B	Measure:									
	- time	H	mncth wfe		nct H	m h wfe		mnct H f	h w e	
	- weight	H	n e	m th w	n H	m cth e	w	n H	m c w	h fe
	- distance		nc H	m t e	t	mnc hH e	w	nc	t H	m h wfe
	- area			mnc H		mncthH e	w	nc	hH	t wfe
	- liquid volume		n H	th	H	n th	mc w e		n H	mc h e
C	Use the following units of measure:									
	- Metric		mncthHwfe		mn thHw e	c f		mncthHw e	f	
	- Imperial		mncthHw e		mncth	Hwfe		mncth	Hwfe	
D	Performing conversions:									
	- imperial to metric or the reverse		t w	n hH e	n	m cthHw e	f	ncthH	m w e	f
E	Read scales such as:									
	- meters, weight and volume scales, thermometers, etc.		mn t Hw	h e	mn t H	c h w e	f	n H	m cth w e	f

m - manufacturing n - natural resources c - construction - transportation h - hospitality service
H - health care w - wholesale & retail f - finance e - education

Occupational Level

	Mathematics	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
19	Are employees required to:									
	- solve numerical problems in word form			nwe		n hH fe	m ct w	n h	ct Hwfe	m
	- use ratio to show comparisons between two numbers					mnch fe	t Hw -	nc f	m thHw e	
	- use proportions to solve problems					mnch w e	t H		mncthHwfe	
	- calculate areas, perimeters and volumes					mnch	t Hwe	nc	m thH e	wf
	- solve problems algebraically at the one variable level					n	m cthH		nc e	m thH f
	- write, simplify and solve two variable algebraic problems						n h		e	nc h f
	- perform geometric calculations						mncth		nc e	h
	- perform trigonometric calculations						n		nc e	

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Occupational Level

	Science	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
20	**General Science:** In the work setting are employees required to have a knowledge of the basic terms, processes, properties and symbols within these topics:									
	- water			ncH e	n	m c H	th we	n	c	m h e
	- matter			c		nc H	m th e		nc	m H e
	- density			c	n	c H	m th e		mnc	t H e
	- levers			m c		mnct H	h we		nc	m t H
	- static electricity			n	n	m H	cth e		n	m c hH e
	- electricity			mnc	n	m c hHe	t w		nc	m hHwe
	- other (specify)									
21	**Biology:** Are employees required to interpret, apply, analyze and synthesize concepts within these topics:									
	- the cell						H		H	e
	- chemistry of life (biology, matter and energy and biological chemistry)						H	H		
	- bioenergetics (chemical energy for life, energy capture, energy release, energy utilization)								H	
	- reproduction						H		H	
	- genetics						H		H	
	- human biology						H		H	e
	- ecology						H		H	t
	- other (specify)									c
22	**Chemistry:** Is it important for employees to have a knowledge of the basic terms, symbols, rules, laws and theories within these topics:									
	- matter						n			mn H
	- atomic structure									m
	- periodic law and characteristics of the types of elements									mn H

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Occupational Level

	Science	Semiskilled			Skilled			Paraprofessional		
		<80	79-50	49-30	<80	79-50	49-30	<80	79-50	49-30
	- chemical bonding						c			mnc H
	- formulae and nomenclatures								H	m
	- equations and reactions									m H
	- gases						mn t H		n	m c hH
	- solutions					H	mnct		mn	c He
	- acids and bases					H	mncth		m H	nc h
23	Physics:									
	Are employees required to have a knowledge of the basic concepts and laws within these topics:									
	- motion					n	m cthH		n	m c H
	- force					n	m cthH		nc	m H
	- heat			c		n	m cthH		nc	m H
	- work, energy, power			c		n	m c hH		ncH	m h
	- wave motion					n	H			mn H
	- electricity AC/DC			n		n	m cthHwe	n		m ctHHe
	- electro-magnetic induction					n	m c H		n	m
	- electronics					n	hHwe		n	m hH
	- nuclear energy									H

m - manufacturing
H - health care

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w - wholesale & retail

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f - finance

- transportation
- education

h - hospitality service

Occupational Level

	Computer Literacy	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
24	In which of the following ways are computers used by your employees:						
	- clerical functions wp/electronic mail			w e	mn thH f		m th wfe
	- payroll/accounts			e	mn thHwf		m th wfe
	- data collection & analysis			w e	mn thH f		m th wfe
	- inventory analysis			e	mn hHwf		m th w e
	- operational planning budgeting/ forecasting						m t w e
	- monitoring & controlling of production equipment (CAD/CAM)						
	- equipment design & testing						
25	What plans do you have to further computerize your company?						
	- clerical functions				m thHw		c hH
	- payroll/accounts				hHw e		c H
	- data collection & analysis				hHwfe		c hH f
	- inventory control				m t Hw		c H
	- operational planning				Hw		m c H f
	- monitoring & control of production equipment				m		m
	- equipment design & testing						
26	Do you consider some degree of computer literacy for new employees to be?						
	- unnecessary						
	- optional						
	- advantageous		n	h	m		n
	- essential		w	wfe	t H	ctfe	Hw

m - manufacturing
h - hospitality service
e - education
n - natural resources
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c - construction
w - wholesale & retail
t - transportation
f - finance

	Work Adjustment Skills	Occupational Level Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
32	In the work setting are employees required to be aware of:						
	- company policies and practices	mncthHwf	e	mncthHwfe		mncthHwfe	
	- employer/employee expectations	mncthHwfe		mncthHwfe		mncthHwfe	
33	Is it important for employees to develop:						
	- positive communication skills for personal use in the work place (polite, assertive)	mncthHwfe		mncthHwfe		mncthHwfe	
	- proper attitudes and motivation necessary to suceed on-the-job (dress, co-operative, punctual)	mncthHwfe		mncthHwfe		mncthHwfe	
	- skills required to advance in the job	mncth wf	H e	mncthHwfe		mncthHwfe	
	- time management skills	cth wf	mn H e	mncthHwfe		mncthHwfe	
	- decision making skills	n h w	m ct H fe	mncthHwfe		mncthHwfe	
34	Is it important for employees to know how to use the skills of:						
	- following instructions	mncthHwfe		mncthHwfe		mncthHwfe	
	- giving feedback	mncthHwfe		mncthHwfe		mncthHwfe	
	- working with supervisors and co-workers	mncthHwfe		mncthHwfe		mncthHwfe	
	- sticking to a schedule	mncthHwfe		mncthHwfe		mncthHwfe	
	- showing initiative	mncthHwfe		mncthHwfe		mncthHwfe	
35	Are employees required to have knowledge of:						
	- basic work place hazards	mncthHw e	f	mncthHw e	f	mnct Hwfe	h
	- first aid		nct w e		mncthHw e		ncthHw e
	- basic legal rights and responsibilities of the job	t	mnc hHwfe	n th w	m c H fe	mnct H e	h wf
	- standard safe work practices	mncthHw e	f	mncth w e	f	mnct Hw e	h f
	- provisions of the Occupational Health & Safety Act	t	mnc hHw e	H mnct	hHw e	m c	n thHw e
	- provisions of the Workers Compensation Act	th	mnc Hw	nct	m hHw e	mnct	hHw e

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Occupational Level

36	Work Adjustment Skills	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
	In your opinion,* is it important for employees to be aware of the following topics:						
	- care of equipment and materials	mncthHwfe		mncthHwfe		mncthHwfe	
	- stress management	H	n h w e	Hw e	mncthf	nc hH fe	m t w
	- community resources		nc Hw e	Hw	mncth e	nc hH e	m t wf
	- substance abuse	mncthHwfe		mncthHwfe		mncthH fe	w
	- personal hygiene	mn thHwfe	c	mncthHwfe		mncthHwfe	
	- human rights	c hH fe	mn t w	cthHwfe	mn	ncthH fe	m w
	- stereotyping	H f	mncth w e	c hHwf	mn t e	c hH fe	mn t w
	- responding to change	mnc hHwfe	t	mncthHwfe		mncthH fe	w
	- nutrition	H	mncth wfe	Hw	mncthfe	H	mncthwfe
	- performance review	nc H fe	m th w	mncthHwfe		mn thH fe	c w
	- factors contributing to worker satisfaction	mnc hHwfe	t	mncthHwfe		mncthH fe	w

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Occupational Level

	Technical Hands-on	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
37	Hand Tools						
	- brace & bit	m	nc		mnct H e		n
	- chisels	m	nc	mnc	t H e		n
	- drills	m	nc	mnc	t H e		n
	- files	m	nc e	mnc	thH e		n
	- hammers	c	n th	mnc	thHwe		n
	- levels	m	nc	mnc	t H e		
	- planes	m	nc		mnc H e		n
	- pliers		ncth	mnc	t H e		nH
	- pry bars	c	n t	mnc	t H e		n
	- ratchets	m	nc	mnc	t H e		n
	- saws	m	nc	mnc	t Hwe		n
	- screw drivers	c	n th	mnc	H e		n
	- socket sets		nc	mnc	t H e		n
	- soldering tools	m	nc	mnc	t H e		n
	- squares	m	nc	mn	ct H e		n
	- vises & clamps		nc	mn	ct H e		n
	- wrenches		nc h	mnc	t H e		n
38	Portable Hand Power Tools:						
	- circular saws		nc		mnc H e		
	- drills		c	mnc	t H e		
	- grinders		nc	nc	m t H e		
	- jigsaws		c		mnct H e		
	- oxy-acetylene welders				mnct e		
	- sabersaws		c		mnc e		
	- sanders		c		mnct H e		
39	Fixed Power Tools:						
	- arc welding				mnct		
	- band saw				m e		
	- bench saw				m e		
	- drill press			m	n t e		
	- jointer				e		
	- lathe				m e		
	- MIG/TIG welding				m		
	- radial arm saw				m e		
	- router						
	- table saw				m e c		

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Occupational Level

	Technical Hands-on	Semiskilled		Skilled		Paraprofessional	
		<80	79-50	<80	79-50	<80	79-50
40	Measuring Devices:						
	- calipers			m e	n tH		n
	- dial indicators			m e	nctH		
	- electronic gauges		n	n e	m ctH		n
	- feeler gauges				mnctH		
	- gauges			m e	nctH		n
	- micrometers			e	m ct		
	- protractors			m e	n		nc
	- rulers		mnc H	mn hwe	ctH	H	nce
	- squares		c	m e	nct		c
	- tapes		mnctH	mnchwe	ctH	H	nce
41	Lab Equipment:						
	- balances						
	- electroscopes, voltmeters				n		
	- bunsen burners, test tubes						
	- magnets						
	- microscopes, slides						
	- PH meters						e
	- volumetric, pipettes, cylinders, flasks						e
42	Other:						

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APPENDIX 8

ANGLOPHONE OCCUPATIONAL SECTOR JOB POSITIONS

SECTOR Construction

SEMI-SKILLED

- Mail Person
- General Labourer
- Roller Operator
- Ashphalt Raker
- Driver
- Piper layer Helper
- Carpenter's Helper
- Building Superintendent
- Roofer

SKILLED

- Electrician
- Pipefitter
- Apprentice
- Receptionist
- Junior Surveyor
- Field Assistant
- Surveyor
- Carpenter
- Clerical
- Heavy Equipment Operator
- Apprentice Plumber
- Plumber
- Secretary
- Cabinet Maker
- Painter
- Refridgeration Mechanic
- Bricklayers
- Speciality Driver
- Batcher
- Concrete Finishers
- Log Fitter
- Sheet Metal Worker

PARA-PROFESSIONAL

- Estimator
- Field Supervisor
- Salesman
- Office Manager
- Lease Administrator
- Para-legal
- Secretary
- Architectural Draftsman

SECTOR Finance

SEMI-SKILLED

Mail Person
Machine Operator
Janitor
Messenger
Mail Room Clerk
Coffee Room Stewardess
Maintenance Person
Telephone Receptionist
Printing Machine
Operator
Courier

SKILLED

Teller
Loans Clerk
Proof Machine Operator
Part-time Teller
Receptionist
Book Keeper
Underwriter
Service Clerk
Secretarial Staff
Computer Operator
Mortgage Clerk
Loans Clerk
Filing Clerk
Mail Clerk
Typing Clerk
Counter Clerk
Maintenance Support
Printer
Word Processing Operator
Operational Clerk
Accounting Clerk
Discount Clerk
Client Service
  Representative
Claims Adjuster
Filing Clerk
Data Entry & Data Base
  Maintenance
Supply Clerk

PARA-PROFESSIONAL

Department
  Supervisor
Senior Teller
Branch Membersh
  Officer
Marketer
Senior Secreta
Ledger Keeper
Trust Departmen
  Clerk
Data System
  Support
Clerical Staff
  Supervisor
Legal & Executi
  Secretary
Bank Officer
Assistant
  Accountant
Operations
  Manager
Central Teller
New Accounts
  Officer
Product Manager
Tax Technician

SECTOR Government / Education

SEMI-SKILLED

- Parking Lot Attendant
- Caretaking Staff
- General Labourer
- Cleaner
- Lavatory Attendant
- Light Equipment Operator
- Ice Rink Operator
- Custodian
- Maintenance Helper
- Snow Removal Staff
- Mail Room Clerk
- Record Clerk
- Food Service Worker
- Painter
- Fieldman
- Switch Board Operator
- Sanitation Worker
- Street Cleaner
- Parks Maintenance

SKILLED

- Secretary
- Bus Driver
- Tradesman
- Handyman/woman
- Clerk/typist
- Truck Driver
- Heavy Equipment Operator
- Gardener
- General Clerk
- Accounting Clerk
- Mechanic
- Carpenter
- Word Processor Operator
- Equipment Operator
- Plant Operator
- Claims Preparation Clerk
- Clerk/Typist
- Electrician
- Security Guard
- Maintenance Mechanic
- Accounts Payable Clerk
- Records Control Clerk
- Firefighter
- Receptionist
- Secretary

PARA-PROFESSIONAL

- Systems Analyst
- Computer Programmer
- Support Service Officer
- Book Keeper
- Housekeeping Instructor
- Test Assessment Officer
- Administrative Assistants
- Executive Secretary
- Content & Music Analysist
- Food Technician
- Support Services Officer
- Teacher Assistant
- Dairy Technician
- Grievance Officer

SECTOR Health Care

SEMI-SKILLED

House Keeping Aide
Janitor
Building Maintenance Staff
Maintenance Helper
Housekeeper
Laundress
Kitchen Help
Cook's Assistant
Ward Housekeeper
General Service Person
Cleaning Service Officer
Laundry Aide
Homemaker

SKILLED

Health Care Aide
Dietary Aide
Clerk
Orderly
Electrician
Secretary
Cook
Carpet & Drapery Cleaner
Carpenter
Medical Secretary
Butcher
Activity Aide

PARA-PROFESSIONAL

R.N.A.'s
Nursing Assistant
Executive Secretary
Ward Clerk
Medical Records Administrator
Preventative Maintenance Technician
Housekeeping Supervisor
Food Service Supervisor

SECTOR Manufacturing

SEMI-SKILLED

Shipper / Receiver
Stock Keeper
Funnel Washer
Driver
Helper
General Labourer & Assistant
Janitor
Assembler
Quality Control
Grinder
Part Cutter
Service Repair Person
Labourer
Light Assembly
Machine Operator
Material Handler
Set-up Operator
Civil Maintenance (landscaping)
Gardener
Farm Labourer
Cleaner
Assembly Line Worker
Collator
Machine Operator
Sewer
Sole Cutter
Trimmer
Sander
Machine Molder
Dock Loader/ Unloader
Packagers
Tow Motor Operator
Operator A
Line Cord Assembly
Slide Line Operator
Wiring Operator

SKILLED

Batterslip Maker
Glaze Maker
Caster
Machinist
Welder
Fitter
Millwright
Mechanic
Recptionist
Fabricator
Electrician
Secretary
Inspector
Pattern Maker Operator
Line Inspector
Process Operator
Pipefitter
Sanitation Engineer
Senior Financial
Clerk
Tool Maker
Tool & Die Maker
Power Line Maintainer
Electrical Operator
Silk Screening & Offset Printing
Lift Truck Operator
Maintenance Mechanic
Stationary Engineer
Data Entry Clerk
Cabinet Maker
Maintenance Technician
Payroll Clerk
Inventory Control Clerk
Billings Clerk
Order Entry Clerk
Machine Operator

PARA-PROFESSIONAL

CAD / CAM
Draftsperson
Supervisor
Electronic Technician
Quality Controller
Computer Programmer
Plant Operations Manager
Production Control Person
Foreman
Control System Technician
Operations Manager
Systems Tester
Computer Operator
Customer Service Representative
Design Assistant
Forester

SECTOR Natural Resources / Utilities

SEMI-SKILLED

Construction Worker
Parks Worker
Recreation Worker
Process Labourer
Mechanical Labourer
Surface Labourer
Cashier
Fish Filleter
Pumper(Pumps Oil)
Tree Planter
Cone Picker
Tree Nursery Worker
Mill Labourer
Woodroom Cleaner
Mine Clerk
Instrument Surveyor
Dockman
Pumper
Truck Driver
Street Light Maintenance
Gas Attendant
Warehouseman
Data Entry Clerk
General Labourer
Instrument Mechanic
Machine Operator
Field Crew
Fish Reeder
Store House Man
Junior Clerk
Store Clerk

SKILLED

Clerical Staff
Auto Mechanic
Furnace Man
Electrician
Driller
Gillnet Fisherman
Draftsperson
Truck Driver
Equipment Operator
Specialized Cutter
Heavy Duty Equipment Mechanic
Millwright
Dept. Secretary
Tradesmen
Cylinder Driver
Bulk Gas Driver
Lineman
Meter Reader
Gas Fitter
Compressor Operator
Serviceman
Control Maintenance
Mechanical Maintenance
Substation Maintenance Service Technician
Equipment Operator
Heavy Equipment Mechanic
Lands Clerk
Cablemen
Customer Services Clerk
Accounting Clerk
Hatchery Technician
Cage Culture Technician
Process Operator
Fisherman
Net Repairer

PARA-PROFESSIONAL

Field Supervisor
Land Administrator
Experienced Construction Worker
Forestry Technicians
Office Supervisor
Operatives Supervisor
Sub Foreman
Leader-Lineman
Leader-Utility
Compressor Station Technician
Trades Supervisor
Office Supervisor
Executive Secretary
Measurement Supervisor
Storehouse Supervisor

SECTOR Service / Hospitality

SEMI-SKILLED

Used Car Reconditioner
Gas Pump Attendant
Presser
Cleaner
Dishwasher
Cleaners
General Labourer
Delivery Person
Construction Labourer
Parts Delivery & Truck Driver
Treeplanter
Tree Climber
Ground Worker
Dockhand for Aircraft
Kitchen Help
General Maintenance
Stag Crew
Hair Dressing Assistant
Linen Attendant
Silk Finisher
Snow-Maker
Lift Operator
Rental Agent
Courteous Driver
Parts Driver
Tree Climber
Ground Worker
Mail Sorter
Housekeeper
Care Taker
Lot Man
Paint Prepper
Switchboard Operator

SKILLED

Mechanic
Secretary
House Keeper
Apprentice
Draftsperson
Maintenance Technician
Bench Technician
Mechanic
Information Researcher Tracer
Accounting Clerk
Travel Agent
Equipment Operator
Camera Sales Person
Building Operators
Spray Form Mechanic
Fireproofing Mechanic
Hair Stylist
Cook
Bartender
Hostess
Automotive Mechanic
Equipment Operator
Wicket Clerk
Maintenance for Plant & Vehicles
Chef
Tradesperson
Acquisitions Clerk
Interlibrary Loans Clerk
Salesperson

PARA-PROFESSIONAL

Parts Manager
Floor Manager
Crew Foreman
Junior & Senior Party Chefs
Camera Shop Manager
Technical Sound & Light Operator
Administrative Assistant
Supervisor
Restaurant Manager
Area Manager
Bar Manager
Data Entry Clerk
Catering Manager

SECTOR Transportation

SEMI-SKILLED

Tank Washer
Truck Driver
Dock Loader
Cleaner
Maintenance Greaser
Driver
Bus Cleaner
Janitor
Painter
Machine Driver
  (plows, grass
  cutting)
Store Clerk
Trackman
Vehicle Shunter
Serviceman
Refueller
Ticket Agent
Mechanic's Helper
Delivery Man
Baggage Handler

SKILLED

Driver
Maintenance Machanic
Automotive Mechanic
Transport Driver
Dispatcher
Salesperson
Secretary
Apprentice
Coach/Bus Driver
Bus Operator
Heavy Equipment
  Operator
Tour Manager
  Machine Operator
Mail Clerk
Stenographer
General Clerical Worker
Fireman's Helper
Locksmith
Vehicle Operator
Aircraft Maintenance
Data Entry Clerk
Computer Operator
Counter Staff
File Clerk

PARA-PROFESSIONAL

Manager
Book Keeper
Inspector
Sales Promoter
Office Supervisor
Draftsman
Purchasing Clerk
Duty Manager
Foreman
Technician
Service
  Manager
Operations
  Supervisor
Soil/Concrete
  Technician
Shop Helper
Express Clerk

SECTOR Wholesale / Retail

SEMI-SKILLED

Porter
Night Clerk
Delivery Man
Warehouse Man
Production Machine Operator
Counter Help
Driver
Shipper/Receiver
Porter
Stockroom Person
Tempeh Production & Packaging
Packer
Checkout Clerk
Food Server
Order Clerk

SKILLED

Sales Clerk
Dept. Manager
Cashier
Clerk (accounts receivable/payable)
Transport Driver
Baker
Payroll Clerk
Secretary
Freight Driver
Restaurant Chef
Butcher
Receptionist
Personnel Clerk
Head Cashier
Book Keeper
Computer Operator

PARA-PROFESSIONAL

Store Manager
Supervisor
Buyer
Comptroller
Merchandiser
Service Technician
Assistant Sales Manager
Floor Manager
Office Manager
Department Manager

APPENDIX 9

FRANCOPHONE OCCUPATIONAL SECTOR JOB POSITIONS

SECTEUR de la Construction

SEMI-SPÉCIALISÉ

- Labourer
- Monteurs / Monteuses
- Opérateur de Machine
- Livreur
- Manoeuvre général
- Travailleur manuel
- Saw Operator
- Drill Operator
- Ouvriers
- Camionneurs

SPÉCIALISÉ

- Carpenter
- Plumber
- Electrician
- Entretien
- Heavy Machine
- Operator
- Poseurs de tapis
- Fitter
- Welder
- Machiniste
- Plombiers
- Opérateurs de Machinerie
- Charpentier

PROFESSIONNEL

- Bookkeeper
- Office Staff
- Surveillant
- Employée de bureau
- Estimator
- Gérante
- Production Planner
- Directeurs de la qualité
- Contremaître

SECTEUR Financier

SEMI-SPÉCIALISÉ

- Concierge
- Opératrice de télex

SPÉCIALISÉ

- Secrétaire/ réceptionniste
- Commis d'escomptes
- Commis intermédiaire
- Caissière
- Entrées au grand livre livre
- Commis d'investissements

PROFESSIONNEL

- Agents de vente

SECTEUR de la fonction publique / éducation

SEMI-SPECIALISÉ

- Concierge
- Prepare au ménage
- Entretien de routes

SPECIALISÉ

- Commis
- Ouvrier
- Commis de finance
- Sécretaire du gérant
- Commis du personnel
- Commis - dactylo
- Opérateur de machines lourdes

PROFESSIONNEL

- Chef des services administratifs

SECTEUR Soins de la Santé

SEMI-SPECIALISÉ

- Housekeeping Aid
- Dietary Aid
- Shipping & Receiving Worker
- Food Services
- Assistante ménagère
- Personnel de cuisine
- Concierge
- Nettoyeur/ménagère
- Cuisinières pour régime alimentaire
- Maintenance
- Aide au soin du ménage
- Cuisinière pour le régime
- Ménagère
- Employés au service de la cuisine, distribution et stérelisation

SPECIALISÉ

- Health Care Aid
- Building Services Janitorial Staff
- Homemakers
- Secretarial Staff Orderly
- Ward Clerks
- Clerk typist
- Mecaniciens de Machine Fixe
- Plombiers
- Secrétaires médicales
- Préposés au service des clients

PROFESSIONNEL

- Office Manager
- Assistant Supervisor
- Bookkeeper
- R.N.A.
- Admission Officer
- Chef
- Aide garde-malades

SECTEUR Manufacturier

SEMI-SPÉCIALISÉ

- Chauffeur de camions
- Garden (ne) de cardage
- Opérateur de mechines
- Metteur en sac
- Travailleur
- Travailleur de châine de montage
- Assembleurs électroniques
- Casseur de verre
- Assembleur d'unité scellée
- Préposé à l'expédition
- Opérateurs de broyeur
- Emballeurs
- Production - travailleur
- Aide de charpentiers
- Ouvriers de production

SPÉCIALISÉ

- Mecanicien du maintient
- Travailleur de bureau
- Installateur de moulin
- Ingénieur de chaudiere 2e & 3e classe
- Opérateur de la machinerie
- Commis - dactylo
- Meneurs d'equipe
- Peintres
- Opérateur de four

PROFESSIONNEL

- Surveillant de groupe
- Assembleur Mécanique
- Opérateurs d'ordinateur
- Gérants de department
- Gérants de la production
- Vendeurs
- Directeur d'inventaire

SECTEUR Ressources naturelles / services publics

SEMI-SPÉCIALISÉ

- Opérateur de presse
- Opérateur de séchoir
- Opérateur de slasher
- Opérateur de loaders
- Opérateur de plant
- Opérateur de chargeurs
- Muckers
- Servicement
- Construction générale

SPÉCIALISÉ

- Mécanicien
- Electricien
- Travailleur de laboratoire
- Opérateur de console
- Millwright
- Drift Leader
- Mine Captain
- Commis Collecteur

PROFESSIONNEL

- Specialiste en formation
- Dessinateur industriel

SECTEUR des Services / hôtellerie

SEMI-SPÉCIALISÉ

- Serveuse
- Cuisinier
- Concierge
- Préposé a l'entretien
- Cuisinier - aide
- Laveur de vaiselle
- Réceptioniste
- Entretien géneral
- Pigiste
- Adresseur de journal
- Livraison du journal

SPÉCIALISÉ

- Courtier en entrainement
- Commis compatable
- Caissière
- Secrétaire legale
- Teneuse de livres
- Receptioniste
- Coiffeuse
- Estheticienne
- Gérante
- Photocomposition - montage
- Secrétaire

PROFESSIONNEL

SECTEUR du Transport

SEMI-SPÉCIALISÉ

- Messager
- Chauffeur
- Trieurs, Trieuses
- Chauffeurs de Taxi

SPÉCIALISÉ

- Mécanicien de machine fixe
- Secrétaire
- Sténo-secrétaire
- Mécanicien - première classe
- Emergency Medical Care Assistant
- Expéditeur
- Camionneurs
- Distributeur

PROFESSIONNEL

- Emergency Medical Technician
- Gérant

SECTEUR des Ventes (en gros et au détail)

SEMI-SPÉCIALISÉ

Servante alimentaire
Traiteur alimentaire
Plongeur
Camionneur
Livreur
Nettoyeur
Concierge
Techniciens
Kitchen Help
Stock Room Clerk

SPÉCIALISÉ

Vendeur
Surveillants de service pour la nourriture
Travailleur de bureau
Camionneurs
Boucher
Boulanger
Pâtissier
Preposés à l'entretien des appareils
Appliance Technicians
Delivery People
Caissier
Che - cuisinier

PROFESSIONNEL

Gérante
Commis aux comptes payables
Opérateurs d'ordinateur
Vendeurs
Gérant de rayons
Floor Managers
Training Managers

APPENDIX 10

ON-SITE POINTS OF OBSERVATION

PART B: COMPANY OR ORGANIZATION TOUR

POINTS OF OBSERVATION

SETTING: Service (Donut Shop)

OCCUPATIONAL LEVEL: Semiskilled (Baker's Assistant)

1. Actual Reading Practices:

A. Contents (subject matter read)
1. machine instructions
2. productivity reports

B. Materials (formats in which various contents appear)
Colour coded diagrams with accompanying explanations

C. Uses (for reading these contents and materials)
To set the equipment for each particular situation

2. Actual Writing Practices:

A. Types reports
orders

B. General Description fill in prepared forms

3. Actual Oral Practices:

A. Types share information and social conversation

B. General Description:

4. Actual Practice of Other Linguistic Skills

A. Problem Solving Situations worked well together when one batch of rolls got stuck in the conveyor belt

B. Use of Judgement seemed to be well prepared to work together to solve problems with minimum excitement

C. Analyses of Situation

D. Other The owner was trying to convince the head mechanic the importance of understanding a productivity spread sheet and include him in the resulting problem solving.

PART B: COMPANY OR ORGANIZATION TOUR

POINTS OF OBSERVATION

SETTING: Retail (Food Chain)

OCCUPATIONAL LEVEL: Semiskilled (Cashier)

1. Actual Reading Practices:

   A. Contents (subject matter read) work schedules, safety notices, company memos, store memos

   B. Materials (formats in which various contents appear) Bulletin Boards, short phrases, sentences, words

   C. Uses (for reading these contents and materials)
   How To Lift Properly
   First Aid
   Safe Practices

2. Actual Writing Practices:

   A. Types Staff Notice

   B. General Description Handwritten re: submission of Holiday Schedules, store policy re: eating merchandise

3. Actual Oral Practices:

   A. Types Department Meetings
   Instructional Direction to individual employees

   B. General Description: Much oral work done according to manager

4. Actual Practice of Other Linguistic Skills

   A. Problem Solving Situations Repair of equipment, Display of Merchandise, Stocking Shelves

   B. Use of Judgement Manuals/Own experience

   C. Analyses of Situation Probable courses of action to take

   D. Other Not much direction in shelve stocking area

PART B: COMPANY OR ORGANIZATION TOUR

POINTS OF OBSERVATION

SETTING: Finance (Bank)

OCCUPATIONAL LEVEL: Skilled (Teller)

1. Actual Reading Practices:

A. Contents (subject matter read)
Application forms for various financial claims
Inter-office communications

B. Materials (formats in which various contents appear)
Applications
Letters
Information booklets

C. Uses (for reading these contents and materials)
Communicate with public (clients)
Initiate Transactions
Inform other co-workers

2. Actual Writing Practices:

A. Types Letters
Financial Statements

B. General Description Non standard letters,
Forms to arrange loans, etc.

3. Actual Oral Practices:

A. Types Teller & Client
Teller & Other Bank Employees
Telephone

B. General Description: To asertain client needs
To execute financial transactions
To verify financial credit rating

4. Actual Practice of Other Linguistic Skills

A. Problem Solving Situations
- redirect clients

B. Use of Judgement as above

C. Analyses of Situation Interpret specific meaning of customer's request

D. Other Promote bank services to clients

PART B: COMPANY OR ORGANIZATION TOUR

POINTS OF OBSERVATION

SETTING: Wholesale (Warehouse)

OCCUPATIONAL LEVEL: Skilled (Sales Clerk)

1. Actual Reading Practices:

   A. Contents (subject matter read) type of equipment, description of equipment, quantity

   B. Materials (formats in which various contents appear) print outs, forms, sales slips, repair slips

   C. Uses (for reading these contents and materials) To process billing, invoices, presentations

2. Actual Writing Practices:

   A. Types Orders, presentation for sales, assessments of needs, floor plans for office furniture

   B. General Description capability of equipment quantity, functions

3. Actual Oral Practices:

   A. Types Telemarketing - making cold calls to sell equipment, speaking to customers for repairs, upgrading

   B. General Description: Inter-office communications, needing certain statistics, figures, dates of delivery, accounts receivable figures, payroll info

4. Actual Practice of Other Linguistic Skills

   A. Problem Solving Situations when repairing and servicing

   B. Use of Judgement when and how to make a sales presentation and what equipment to recommend

   C. Analyses of Situation

   D. Other Informing customers about preventative maintenance of equipment (computers) such as avoiding surging.

PART B: COMPANY OR ORGANIZATION TOUR

POINTS OF OBSERVATION

SETTING: Manufacturing (Florsheim)

OCCUPATIONAL LEVEL: Paraprofessional (Sales Person & Supervisor)

1. Actual Reading Practices:

   A. Contents (subject matter read) Safety Notices, Personnel "Boosters", Product Information, Training Information, Company Memos

   B. Materials (formats in which various contents appear) Posters, Reference Manuals, Bulletin Boards, Words, Short Phrases, Sentences

   C. Uses (for reading these contents and materials) To bring replacement staff up-to-date, improve service to customers and company

2. Actual Writing Practices:

   A. Types Short notes

   B. General Description Sign-in sheets, leaving notes for replacement workers

3. Actual Oral Practices:

   A. Types Department Meetings
   Training Sessions

   B. General Description: Outside Product Saleman addressing staff, attendance at training sessions in training room

4. Actual Practice of Other Linguistic Skills

   A. Problem Solving Situations Product deficiences

   B. Use of Judgement When to refer

   C. Analyses of Situation Use of reference manuals

   D. Other To receive many oral directives

PART B: COMPANY OR ORGANIZATION TOUR

POINTS OF OBSERVATION

SETTING: Natural Resources/Utilities (Public Utilities Commission)

OCCUPATIONAL LEVEL: Paraprofessional (Operations Centre Staff Person)

1. Actual Reading Practices:

A. Contents (subject matter read) Regulations, safety materials, technical information, symbols

B. Materials (formats in which various contents appear)

- Manuals	- Blue Prints
- Reports	- Schematics
- Directives	- Maps
- Periodicals	

C. Uses (for reading these contents and materials)

2. Actual Writing Practices:

A. Types Safety reports, work orders, requisitions

B. General Description All areas have to fill out requisition forms for equipment use, complete information on work orders as well as complete safety reports (the company has a good safety record and it is a high priority

3. Actual Oral Practices:

A. Types Troubleshooting

B. General Description: Workers in the field calling back by radio or telephone for assistance with unfamiliar/ complex faults or problems

4. Actual Practice of Other Linguistic Skills

A. Problem Solving Situations Customer Complaints (Telephone)

B. Use of Judgement Customer Complaints (Telephone)

C. Analyses of Situation Customer Complaints (Telephone)

D. Other Communications Skills - Dealing with unhappy customers (Telephone and Reception)

APPENDIX 11

OBS TERMINAL AND ENABLING OBJECTIVES

BASIC COMMUNICATIONS

READING:

Learning Outcome: Read with literal and critical comprehension.

OBJECTIVES:

A. Demonstrate pre-reading skills.

1. Identify and name all the letters of the alphabet written in capital and small letters.
2. Read numbers to 100.
3. Identify and pronounce the regular sound of each consonant and associate it with its letter.
4. Identify the visual similarities and differences between shapes, numbers, letters and words.
5. Label two words as the same or different given a written list of words.
6. Identify the visual beginning and end of a word, of a cartoon sequence and of a sentence.
7. Identify and pronounce the short sound of each vowel and associate it with its letter.

B. Read, using decoding and encoding skills (word attack and phonics, predicting, contextual clues and personal experience).

1. Sound out regular Consonant-Vowel-Consonant (CVC) words.
2. Use context to identify common words including sight vocabulary.
3. Use predicting skills to identify common words including sight vocabulary.
4. Read orally short sentences composed of known sight words, CVC words and personal student vocabulary.
5. Match words and/or pictures with definitions.

6. Identify punctuation marks as clues to word and sentence meaning.

7. Identify relationships by classifying words.

8. Use context to find meaning of new vocabulary.

9. Organize sequences of words, sentences and paragraphs.

10. Identify the common patterns in simple long vowel words.

11. Identify common contractions and abbreviations in context.

12. Identify the number of syllables in written words.

13. Read using correct stress.

14. Read vowel combinations.

    i.e. ou, ow, oi, oy, etc.

15. Read words with silent consonants.

C. Interpret symbols, signs, maps, floor plans, schedules and tables.

1. Explain meanings of symbols and signs related to directions, transportation, health/safety and household items.

2. Use titles, keys/legends to decode information on floor plans, maps and schedules.

3. Translate time, for 12 hour and 24 hour clocks to decode information on transit schedules, work schedules and timetables.

D. Determine key information from simple notes, messages, memos and simple instructions.

1. Use the 5 W's to identify key words in samples provided.
2. Demonstrate knowledge by recalling facts orally and in writing.
3. Relate sequences to events.

4. Follow simple written instructions.
5. Read and answer short detail questions such as who, what, where, when and how.

E. Identify main ideas in various written media (e.g. stories, articles, instructional leaflets and handbooks).

1. State the general subject of a given article.
2. Find the topic sentence in a given selection.
3. Read and orally identify characters and events.
4. Read and orally summarize a story.
5. Locate and state the main idea.
6. Identify emotional reactions of story characters.
7. Support answers with details from reading.
8. Identify cause and effect in a story.
9. Compare and contrast elements in a story.
10. Infer main idea, supporting details, sequence, comparisons, cause and effect - when not specifically stated in reading material.
11. Draw conclusions.
12. Predict outcomes.
13. Detect mood and atmosphere of story.
14. Explain meaning of figurative language.
15. Relate reading to real life situations.

F. Distinguish between fact and opinion.

1. Identify key words or phrases that signal opinions and factual statements.
2. Explain what makes a statement factual and identify examples of factual statements from a variety of written materials.

3. Explain what makes an opinion and identify examples from a variety of written materials.

G. Determine the writer's purpose.

1. Explain the aims and goals of various types of writing.
2. Read and select key words/phrases that indicate the writer's purpose.
3. Detect author's point of view and/or bias.
4. Identify connotation and denotation.
5. Discriminate between reality and fantasy.

WRITING:

Learning Outcome: To write proficiently for different purposes using a variety of forms.

OBJECTIVES:

A. Demonstrate basic writing skills

1. Reproduce the alpha-numeric system.
    a. copy shapes, numbers and letters
    b. write all letters in upper and lower case from memory
    c. write numbers to 100 in numerals
2. Copy words and sentences.
3. Associate written words with what they represent.
4. Write down the initial consonant and/or final consonant in words given orally.
5. Identify a simple sentence.
6. Identify the form of a paragraph.

B. Use correct mechanics.

1. Spelling:

   a. spell some basic sight words after repeated experience in sentence text

   b. fill in the missing letter in regular CVC words

   c. read, pronounce, spell:

      - simple short vowel words with various consonants
      - simple short vowel words with final double consonants (ll, ss, ff)
      - simple short vowel words with consonant combinations representing one sound (sh, ch, th, ng, wh)
      - plural forms of regular sight words and simple short vowel words
      - simple short vowel words with consonant blends that represent two sounds
      - some simple common words with 'ar' and 'er'
      - identify common patterns for simple short vowel words
      - identify root words when shown sight words and simple short vowel words with suffixes (ing, er, ed, es, y)
      - write singular and plural forms of regular nouns
      - distinguish plurals from possessives (dogs, dog's)

   d. spell regular words in written work or when given in a dictation

   e. take down simple sentences given orally

   f. read, pronounce and spell sight words, simple short vowel words, and personal vocabulary with suffixes when there is no change in root word

   g. read, pronounce and spell simple and known words with suffixes when final consonant has been doubled or a silent 'e' dropped

   h. fill in missing letters in common long vowel words

i. read, spell, pronounce:

- simple words with long vowel sounds
- simple words with three letter consonant blends
- words with the suffixes 'ed, ing, y, ful, s, ly, less, ness, ment, th'
- names of days and months
- common contractions and abbreviations

j. read, pronounce and spell some common homonyms and compounds

k. read, pronounce and spell numbers to 100

l. write sentences using spelling or vocabulary words

m. read, pronounce, spell:

- common two-syllable, phonetically regular words with long or short vowel sounds in the first syllable (diner or dinner)
- words containing the vowel combinations: oo, aw, au, ow, ou, oi, oy, ew, ek, ie
- common irregular plurals f-ves, o-os, oes, goose-geese
- words with silent consonants
- words with common prefixes

n. read pronounce, spell:

- words to which suffixes have been added including those ending in ce, ge, y and in which stress is a factor
- common words with unstressed vowel sounds
- common words with unusual patterns
- increasingly difficult words that follow regular (vowel and consonant, prefix and suffix) patterns
- a list of commonly misspelled words
- words with a variety of prefixes and suffixes

o. divide words into syllables

2. Punctuation:

a. punctuate end of sentences with a period or question mark

b. punctuate with comma series, interrupting elements, appositives and tag questions and compound sentences

c. differentiate between and punctuate direct and indirect quotes

d. differentiate between plurals and possessives

e. recognize contractions

f. recognize letter format

3. Capitalize proper nouns, titles, sentence beginnings.

C. Use correct structure and syntax.

1. Select words to complete a sentence.

2. Construct sentences from short lists of subjects and predicates.

3. Reassemble a mixed-up cartoon or picture sequence.

4. Reassemble a mixed-up sentence.

5. Distinguish between sentences and fragments of sentences.

6. Complete a simple sentence when given a fragment, i.e. subject or verb missing.

7. Construct sentence answers to questions using words and phrases in question.

8. Use simple and progressive verb tenses correctly.

9. Write sentences that show subject verb agreement.

10. Use pronoun forms correctly.

11. Distinguish between sentences and fragments or run-ons.

12. Write simple, complex and compound sentences.

D. Demonstrate understanding of the writing process.

1. Compose and punctuate declarative, interrogative, imperative and exclamatory sentences.

2. Write simple declarative and interrogative sentences.

3. Sequence pictures, cartoons; write sentences about each picture to create a descriptive paragraph.

4. Write sentences in simple present, past, future and present progressive tenses.

5. Compose simple sentences based on personal experience and vocabularly.

6. Use correct paragraph form.

7. Write short personal experience stories.
8. Punctuate own writing properly.
9. Write well organized, logical paragraphs for different purposes.
10. Write descriptive paragraphs using vivid verbs, adjectives and adverbs.
11. Express and argue point of view in essays of 2-3 paragraphs.

SPEAKING AND LISTENING:

Learning Outcome: Upon completion of this level, the student will be able to speak and listen effectively.

OBJECTIVES:

A. Demonstrate basic listening skills.

1. State the number of words in a simple sentence given orally.
2. Identify the initial consonant and/or the final consonant of words given orally.
3. Identify rhyming words given orally.
4. State the number of sounds in a phonetically regular CVC word given orally.
5. Hear and identify long vowel sounds.
6. Hear a number of syllables in a word.
7. Distinguish between single consonant sounds and consonant blends.
8. Distinguish between the long and short sounds of each vowel.
9. Identify contractions orally.
10. Use contractions and long form in speaking.
11. Identify the number of syllables in speech.
12. Identify stressed syllables.
13. Identify homonyms from spoken content.

14. State the root of a given word with a suffix and/or prefix.

B. Ask and answer questions coherently and concisely.

1. Use the six journalism questions (Who, What, Where, When, Why and How).

2. Demonstrate language and behavior appropriate to the situation.

C. Give and follow directions or instructions.

1. Break a task into a logical sequence.

2. Provide/recognize key words and details.

3. Ask/answer clarifying questions.

D. Present/evaluate a point of view or information effectively.

1. a. Choose and organize related ideas.

   b. Present ideas clearly in standard English.

   c. Use appropriate voice and body language (eye contact, posture, gestures).

   d. Adjust presentation according to audience participation/reaction.

APPLICATIONS OF BASIC READING, WRITING, SPEAKING AND LISTENING SKILLS

1. Follow simple oral instructions.

2. Follow directions given in picture symbols. (+ - $)

3. State and write own name, address and telephone number.

4. Read price tags.

5. Alphabetize words according to first letter.

6. Address envelopes.

7. Identify common written signs. (Stop, Danger, Walk)

8. Locate phone numbers in a phone book, given the name and address.

9. Follow directions on labels and packages.

10. Read and follow simple charts, maps and diagrams.

11. Read and fill in simple forms with fill-in-the-blanks, true/false, multiple choice and short answer questions.

12. Compose a short written message.

13. Fill out simple application forms.

14. Write a simple covering letter describing self to potential employer.

15. Organize material to go into a resume.

16. Use tables of contents to locate items in a variety of resources.

17. Alphabetize words that begin with the same three letters.

18. Use an index to locate information in a book.

19. Use guide words to locate information in a book.

20. Use dictionaries to check spelling and locate meanings of words.

21. Use dictionaries to find the number of syllables in words and how to divide words into syllables.

22. Use dictionaires to find pronunciation and stress for words.

23. Locate books in library by use of a card catalogue.

24. Identify various services and resources available at local libraries.

25. Read and follow instructions on care and operation of common things such as home appliances and automobiles.

26. Use manuals to find information.

27. Relate reading to personal experiences, especially in career exploration and classifications.

28. Write different types of letters.

29. Complete common government, banking and application forms.

30. Research and write reports and other projects.

31. Summarize factual material.

32. Use common reference books such as dictionaries, encyclopedias, thesauruses and atlases.

33. Prepare a personal data sheet or resume to accompany a letter of application.

34. Respond to advertisements, newspapers, stories, radio journalism, etc.

35. Acquire information from and about agencies.

36. Critically analyze own communication skills toward self-improvement.

37. Appraise validity of material from own experiences and other criteria.

READING:

Learning Outcome: Upon completion of this level the student will be able to read with literal and critical comprehension.

OBJECTIVES:

A. Locate information for a specific purpose using a variety of sources such as telephone directories, industrial directories, catalogues, manuals, dictionaries, thesauruses and encyclopedias.

1. Describe the purpose of basic reference sources such as dictionaries, directories, manuals, etc.
2. Use the catalogue system of a library (card, computer or microfiche), locate the various sections of the library, and request assistance from library staff.
3. Use a table of contents and/or index from reference material.
4. Skim and scan reference materials.

B. Recognize symbols and signs; interpret maps, floor plans, schedules, charts, tables and graphs.

1. Locate and use titles, legends and keys on graphic representations.
2. Locate and use the scale on graphic representations.
3. Interpret math symbols and units of measurement commonly used on graphic representations.
4. Identify different types of graphs.
5. Locate information on a matrix.

C. Determine key information from notes, messages, memos, vouchers, invoices, claims, simple instructions, letters and short reports.

1. Identify the common forms and structures of short business communications.
2. Identify whole numbers, decimals, fractions and units of measure.

3. Interpret figures, units of measure, symbols and abbreviations used in business communications.

D. Identify main ideas and details in magazines, newspapers and related occupational articles.

1. Identify typical structures of magazines, newspapers and occupational articles.
2. Identify the purpose of a given article.
3. Locate the main thesis in a given article.
4. Identify typical supporting details such as statistics, expert opinions and observations.
5. Apply the six journalism questions (Who, What, Where, When, Why and How) to news articles to extract main points.

E. Distinguish between fact and opinion and cause and effect, make inferences and determine writer's purpose and audience.

1. Identify key words or phrases that signal opinions and facts.
2. Explain what makes a statement factual and identify examples of factual statements from a variety of written materials.
3. Explain what makes an opinion, judgment, inference.
4. Identify examples of opinion, judgment, inference by using a variety of written materials.
5. Identify the main purpose of a piece of writing and the methods used to achieve it.

WRITING:

Learning Outcome: Upon completion of this level the student will be able to write proficiently for different purposes using a variety of forms.

OBJECTIVES:

A. Demonstrate control of standard written English.

1. Use correct mechanics.

2. Use correct structure and syntax.
3. Use correct word choice/usage.

B. Demonstrate understanding of the writing process.

1. Generate and select ideas for a specific purpose.
2. Use prewriting strategies such as brainstorming, clustering and drawing on experience.
3. Incorporate relevant, specific and appropriate material/ideas.
4. Support main idea(s) appropriately.
5. Organize writing logically and coherently.
6. Revise and edit using a variety of techniques.

C. Apply writing skills and strategies (as outlined in A and B) to:

1. Complete forms and questionnaires.
2. Write memos, letters, and resumes.
3. Summarize articles in point form and in sentences.
4. Compose a series of paragraphs to develop a theme in a report or essay.

SPEAKING AND LISTENING:

Learning Outcome: Upon completion of this level, the student will be able to speak and listen effectively in a variety of situations.

OBJECTIVES:

A. Ask and answer questions coherently and concisely.

1. Use the six journalism questions (Who, What, Where, When, Why and How).
2. Demonstrate language and behavior appropriate to the situation.

B. Give and follow directions or instructions.

   1. Break a task into a logical sequence.
   2. Provide/recognize key words and details.
   3. Ask/answer clarifying questions.

C. Present/evaluate a point of view or information effectively.

   1. a. Choose and organize related ideas.
      b. Present ideas clearly in standard English.
      c. Use appropriate voice and body language (eye contact, posture, gestures).
      d. Adjust presentation according to audience participation/reaction.
   2. a. Interpret speaker's intent through voice and body language.
      b. Confirm the speaker's intent by identifying key words, facts, opinions and implied meanings.
      c. Draw conclusions by summarizing, restating or questioning further.

ADVANCED LEVEL COMMUNICATIONS

READING:

Learning Outcome: Upon completion of this level the student will be able to read with literal and critical comprehension.

OBJECTIVES:

A. Locate information for specific research purposes using a full range of resources.

   1. Use the catalogue systems and indexes available in a library, including periodical indexes and computer or microfiche catalogues.
   2. Use various reference materials such as specialized dictionaries, almanacs, directories, encyclopedias and government publications.
   3. Use the sections of books (table of contents, indices, etc.) newspapers and magazines.
   4. Derive information from a variety of community, industrial or business literature such as leaflets, newsletters and annual reports.
   5. Skim and scan various reference materials.
   6. Assess the usefulness of information or ideas in various written materials.

B. Interpret symbols, signs, maps, floor plans, charts, tables and graphs.

   1. Locate and use titles, legends and keys on graphic representations.
   2. Locate and use the scale on graphic representations.
   3. Interpret math symbols and units of measure commonly used on graphic representations.
   4. Identify different types of graphs.
   5. Locate information on a matrix.
   6. Draw inferences and conclusions from information given in graphic representations.

C. Determine facts, opinions and inferences from a wide variety of written material.

1. Identify key words or phrases that signal opinions, judgments, conclusions and factual statements.
2. Explain what makes a statement factual and identify examples of factual statements from a variety of written materials.
3. Explain what constitutes a conclusion, judgment, opinion and inference; identify examples of each in a variety of written materials.
4. Identify typical techniques used to support conclusions such as statistics, expert opinions, concrete examples, etc.
5. Identify typical developmental patterns of writing such as cause and effect, classification, example, etc.
6. Analyze the logical development of a piece of writing recognizing common logical fallacies.
7. Evaluate the plausibility of a writer's conclusions.

D. Evaluate the style and content of a variety of written materials.

1. Describe and evaluate the style of a given piece of writing with reference to level of formality, imagery, clarity, variety of sentence structure, freshness and vividness of expression, diction, tone and rhythm.
2. Determine the intended audience and purpose of a given piece of writing and evaluate whether the piece succeeds in its purpose.
3. Determine whether the content of a piece of writing is sufficient and appropriate for the intended audience and purpose.

WRITING:

Learning Outcome: Upon completion of this level the student will be able to write proficiently for different purposes using a variety of forms.

OBJECTIVES:

A. Demonstrate control of standard written English.

1. Use correct mechanics.
2. Use correct structure and syntax.
3. Use correct word choice/usage.

B. Demonstrate understanding of the writing process.

1. Generate and select ideas for a specific purpose.
2. Use prewriting strategies such as brainstorming, clustering and drawing on experience.
3. Incorporate relevant, specific and appropriate materials/ideas.
4. Support main idea(s) appropriately.
5. Organize writing logically and coherently.
6. Revise and edit using a variety of techniques.

C. Apply writing skills and strategies as outlined in A and B to:

1. Complete forms and questionnaires.
2. Write memos, letters, resumes and estimates.
3. Summarize and synthesize information from several sources.
4. Write a research paper and/or report with appropriate references.

SPEAKING AND LISTENING:

Learning Outcome: Upon completion of this level, the student will be able to speak and listen effectively in a variety of situations.

OBJECTIVES:

A. Ask and answer questions coherently and concisely.

  1. Use the six journalism questions (Who, What, Where, When, Why and How).
  2. Demonstrate language and behavior appropriate to the situation.

B. Give and follow directions or instructions.

  1. Break a task into a logical sequence.
  2. Provide/recognize key words and details.
  3. Ask/answer clarifying questions.

C. Present/evaluate a point of view or information effectively.

  1. a. Choose and organize related ideas.
     b. Present ideas clearly in standard English.
     c. Use appropriate voice and body language (eye contact, posture, gestures).
     d. Adjust presentation according to audience participation/reaction.
  2. a. Interpret speaker's intent through voice and body language.
     b. Confirm the speaker's intent by identifying key words, facts, opinions, implied meanings.
     c. Draw conclusions by summarizing, restating or questioning further.

OBJECTIVES

To the satisfaction of the instructor, the students will be able to:

A. Recognize, explain and apply the language of mathematics relevant to one's assessed needs and learning styles.

   1. Identify, in horizontal and vertical form, mathematical symbols in simple mathematical equations such as:

      +, -, x, ÷, =, >, <

      i.e. $2 + 3 = 5$
      $5 - 3 = 2$
      $4 \times 7 = 28$
      $8 \div 4 = 2$

      $7 > 4$
      $2 < 3$

      $$\begin{array}{r} 2 \\ \underline{+3} \\ 5 \end{array} \qquad \begin{array}{r} 4 \\ \underline{\times 7} \\ 28 \end{array}$$

   2. Identify mathematical terminology in spoken and written form such as:

      plus/and
      minus/subtract/take away
      times/multiplied by/groups of
      divided by/goes into
      equals/totals/sum

B. Apply the number system to the reading and writing of numbers. For whole numbers comprising up to seven digits:

   1. Read the numbers in numeric form.
   2. Read the numbers in written form.
   3. Write the numbers in numeric form.
   4. State the place value of any digit.
   5. Compare numbers and put them in order.
   6. Round numbers.

C. Perform basic mathematics operations of addition, subtraction, multiplication and division of whole numbers.

1. Solve horizontal and vertical addition problems with numbers comprising up to 5 digits using carrying.

   i.e. 1234
   5678 1234 + 5678 + 9986 =
   9986
   ____

   a. Solve word problems involving addition of whole numbers.
   b. Check calculations manually using the appropriate operations.

2. Solve horizontal and vertical subtraction problems for pairs of numbers comprising up to 5 digits, using borrowing/regrouping.

   i.e. 7824
   - 1753 7824 - 1753 =
   ____

   a. Solve word problems involving subtraction of whole numbers.
   b. Check calculations manually using the appropriate operations.

3. Solve horizontal and vertical multiplication problems for a pair of numbers to 3 digits.

   i.e. 276
   x 321 321 x 276 =
   ____

   a. Solve word problems involving multiplication of whole numbers.
   b. Check calculations manually, using the appropriate operations.

4. State the first ten multiples of whole numbers from 1 - 12.

5. Distinguish even numbers from a collection of ten numbers containing even and odd numbers, including 0.

   i.e. 1, , 3, 255, 68, 3001, 0, 52, 7, 11

6. Solve a horizontal division problem with a single digit divisor and no remainder.

   i.e. 49 ÷ 7 = 7

7. Transpose a horizontal division problem to long division form.

   i.e. 49 ÷ 7 to 7|49

8. Solve a long division problem with up to a 3 digit divisor.

   i.e. 237|1246

   a. Solve word problems involving division of whole numbers.
   b. Check calculations manually using appropriate operations.

9. Write whole numbers to a maximum of 7 digits in expanded form.

   i.e. 1345 = (1 x 1000)+(3 x 100)+(4 x 10)+(5 x 1)

10. Solve numerical problems requiring the use of order of operations (excluding exponents).

    i.e. (2 x 3) + 4 - 6 x 2 ÷ 3

11. Identify perfect squares, square roots and exponents.

12. Solve for an unknown in a simple equation.

    i.e. ? + 5 = 7

13. Check computations using a calculator.

D. Recognize a variety of common geometric shapes as they appear in the environment.

1. Identify a variety of common geometric shapes.

2. Draw freehand a variety of common geometric shapes.

3. Draw, using a geometric set, a variety of common geometric shapes.

4. List familiar geometric shapes as they appear in the environment.

   i.e. road signs

E. Perform basic fractional operations.

1. State the three meanings of a fraction including:

   a. a fraction is one equal part or several equal parts of one unit.
   b. a fraction is an indicated division.
   c. a fraction is a ratio of 2 numbers.

2. Name the parts of a fraction.

3. Change a fraction to its equivalent.

4. List all the factors of whole numbers.

5. Identify common factors of whole numbers.

6. Identify G.C.F. or H.C.F. (Greatest Common Factor).

7. Reduce fractions to lowest terms.

8. Define prime and composite numbers.

9. Factor a number to its prime components.

   i.e. 8 = 2 x 2 x 2 (or using a factor tree)

10. Solve for LCF (Lowest Common Factor).

11. Solve for LCD (Lowest Common Denominator).

12. Compare fractions and rank according to size.

13. Change improper fractions to mixed numbers and vice versa.

14. Add horizontal and vertical groups of fractions with common denominators.

    i.e. 1/3 + 2/3

15. Add horizontal and vertical groups of fractions with unlike denominators.

    i.e. 1/4 + 1/3

16. Add horizontal and vertical groups of mixed numbers with unlike denominators.

    i.e. 2 1/3 + 3 2/3

17. Subtract horizontal and vertical fractions with unlike denominators.

    i.e. 3/4 - 1/3

18. Regroup mixed numbers in preparation for subtraction.

19. Subtract horizontal and vertical mixed numbers.

    i.e. 4 1/3 - 2 4/5

    a. Solve word problems involving addition or subtracting of fractions.

20. Multiply fractions.

    i.e. 1/3 x 4/5

21. Multiply fractions using cancellation.

22. Multiply fractions by whole numbers.

    i.e. 1/3 x 2

23. Multiply mixed numbers.

24. Find the reciprocal of a whole number, fraction or mixed number.

25. Divide fractions, whole numbers and mixed numbers.

    a. Solve word problems using multiplication and/or division of fractions.

F. Describe the basic concepts associated with decimal fractions and apply that knowledge in various economic and occupational settings.

1. Read a decimal fraction, identifying place value in numeric and word form.

2. Write a decimal fraction in numeric and word form.

3. Rewrite a whole number as a decimal fraction.

   i.e. 5 = 5.0

4. Compare decimal fractions and rank according to size.

5. Round off decimal fractions.

6. Add horizontal and vertical decimal fractions.

7. Subtract horizontal and vertical decimal fractions.

   a. Solve word problems using addition or subtraction of decimal fractions.
   b. Check calculations using appropriate operations.

8. Multiply horizontal and vertical decimal fractions, locating decimal point appropriately and adding zeros as necessary.

9. Divide horizontal and vertical decimals by whole numbers.

   i.e. 4|12.8 or 12.8 ÷ 4

10. Divide decimals by decimals locating decimal point appropriately.

    i.e. 12.5|298.6

    a. Solve word problems using multiplication and division of decimals.

11. Convert decimal fractions to common fractions and vice versa.

12. Compare decimal fractions to common fractions.

G. Apply percentages to various economic and occupational settings.

1. Read percents in numeric and word form.

2. Write percents in numeric and word form.

3. State the meaning of percent.

    a. Show in pictorial form the meaning of percent.

    i.e. on graph paper 6% = 6/100

4. Convert from percent to decimal to fraction in any order.

i.e.	%	Decimal	Fraction
	50%	.50	1/2

    a. Solve word problems using percents.

H. According to individual interests, apply learning strategies to one or more selected areas where mathematics is utilized in daily activities.

1. Estimate and measure using metric measurements temperature, linear, volume and mass.

2. Estimate and measure using Imperial measurements temperature, linear, volume and mass.

3. Solve word problems involving time measurements and zones.

4. Solve problems concerning banking/monetary transactions.

5. Solve problems concerning culinary measures.

6. Read common gauges and meters such as gas meters, speedometers, water meters, parking meters, barometers and clocks.
7. Extract information from maps, scales and manuals.
8. Read pie, bar and line graphs.
9. Calculate perimeter, area and volume of squares and rectangles.

INTERMEDIATE MATH CORE

OBJECTIVES

To the satisfaction of the instructor, the students will able to:

A. Review whole number operations.

1. Express whole numbers in expanded form.

   i.e. $825 = 8 \times 100 + 2 \times 10 + 5 \times 1$

2. Add, subtract, multiply and divide whole numbers.

3. Understand and use the properties of whole numbers to check addition, subtraction, multiplication and division of whole numbers.

   i.e. $8 \div 2 = 4$ therefore $4 \times 2 = 8$

4. Solve word problems using the basic operations of whole numbers.

   i.e. $5 - 2 = 3$ therefore $3 + 2 = 5$

5. Identify the following terms: factor, base, exponent, perfect square, square root, prime number, composite number.

6. Evaluate exponential expressions and finding square roots of perfect squares.

   i.e. $5^2 = 5 \times 5 = 25$ therefore $5^2 = 25$
   therefore $\sqrt{25} = 5$

7. Use prime factorization to find the least common multiple of two or more composite numbers.

8. Use the order of operations rules and the grouping symbols.

B. Review fraction operations.

1. State the three meanings of a fraction.

2. Identify the following terms: numerator, denominator, proper fraction, improper fractions, equivalent fraction.

3. Expand fractions to higher equivalent forms.

4. Reduce fractions to lowest terms.

5. Use the cross products to determine whether or not two fractions are equivalent.

6. Find the lowest common denominator for a group of fractions.

7. Compare fractions.

   i.e. indentify the largest: 2/3, 11/15, 15,21

8. Identify a mixed number and change it to an improper fraction.

9. Change an improper fraction to a mixed number.

10. Add and/or subtract a group of fractions and/or mixed numbers.

11. State the reciprocal of any whole number, fraction or mixed number.

12. Multiply a whole number, a fraction, or a mixed number by a fraction or a mixed number.

13. Divide a whole number, a fraction or a mixed number by a fraction or a mixed number.

14. Evaluate a fraction raised to a positive integer exponent.

15. Evaluate the square root of fractions that are perfect squares.

16. Simplify complex fractions.

C. Perform decimal operations.

1. Write a decimal in expanded notation.

   i.e. 2.103 = 2 x 1 + 1/10 + 0/100 + 3/1000

2. Round decimals to a given place value.

3. Add and subtract decimals.

4. Multiply and Divide decimals.

5. Change decimals to fractions and fractions to decimals.

6. Solve word problems using decimal operations.

D. Perform basic metric (SI) operations.

1. Write the symbols and state the meaning of commonly used prefixes in the metric system (SI).
2. Convert between units of the metric system.
3. Solve word problems involving metric units.
4. Compare and convert between SI and Imperial systems.
5. Use caluclators, tables, manuals.

E. Perform percent operations.

1. Explain the meaning of percent.
2. Change percents to fractions and fractions to percents.
3. Change percents to decimals and decimals to percents.
4. Compare fractions, decimals and percents.

   i.e. determine the largest: 3/8, 0.385, 3.85%
5. Translate simple English sentences into algebraic expressions.

   i.e. 5 more than a number is 7 therefore $x + 5 = 7$
6. Solve simple equations.
7. Using equations:
   a. find a percent of a number.
   b. find a number when a percent of it is known.
   c. find what percent one number is of another.
8. Estimate answers in order to avoid obvious mistakes.
9. Solve applied problems involving the three types of percent problems.
10. Identify the original amount, the new amount, the amount of increase, the amount of decrease.
11. Solve problems involving percent increase.
12. Solve problems involving percent decrease.

F. Perform signed number operations.

1. Understand the concept of positive and negative numbers and locate them on an appropriate number line.
2. Identify integers.

3. Use the symbols < and > to indicate the relationship between pairs of numbers.
4. Find the absolute value of a number.
5. Understand the concept of the negative of a number.
6. Simplify numbers preceded by a series of minus and plus signs.
7. Add signed numbers.
8. Subtract signed numbers.
9. Evaluate expressions involving both addition and subtraction of signed numbers.
10. Multiply signed numbers.
11. Evaluate signed numbers raised to a power.
12. Divide signed numbers.
13. Evaluate expressions involving exponents and the four basic operations of addition, subtraction, multiplication and division.

G. Perform exponent and scientific notation operations.

1. Evaluate variable expressions given the numerical (integer) values of the letters.
2. Simplify expressions by using the Laws of Exponents.
3. Evaluate numerical expressions involving negative exponents.
4. Evaluate numerical expressions involving zero exponents.
5. Simplify and evaluate exponential expressions.
6. Write fractions in product form using negative exponents.
7. Change numbers in ordinary notation to their scientific notation and vice versa.
8. Use scientific notation to multiply and divide very large and small numbers.
9. Use a calculator to evaluate expressions involving very large and small numbers.

H. Read, explain and perform ratio and proportion operations and to use ration and proportion to solve problems.

1. Understand the concept of a ratio.
2. Find the ratio of one quantity to another quantity.
3. Solve word problems involving a proportion.
4. Convert between units of measures using conversion ratios.

I. Perform algebraic operations.

1. Understand the concepts of algebraic expressions, terms, like terms.
2. Add and subtract like terms.
3. Remove a grouping symbol which is preceded by a plus or a minus sign.
4. Simplify algebraic expressions by removing grouping symbols and collecting like terms.
5. Vertically add and subtract algebraic expressions.

J. Solve linear equations.

1. Solve linear equations in one variable with whole number coefficients.

K. Solve algebraic word problems.

1. Derive an equation in one unknown.
2. Solve word problems involving one unknown.
3. Express several unknowns in terms of one variable.

L. Manipulate formulae.

1. Evaluate simple formulas for specific values.
2. Solve (rearrange) a simple formula for a specific variable of the formula.

INTERMEDIATE BUSINESS MATH

OBJECTIVES

To the satisfaction of the instructor, the students will be able to:

A. Perform basic business mathematic operations.

1. Correctly calculate extensions and totals of invoices.
2. Correctly calculate cost prices, discounts and single equivalent discounts.
3. Correctly calculate margin or mark-up from either cost or retail prices.
4. Correctly calculate cost of goods when sale price and mark-up are known.
5. Correctly calculate sale price when cost of goods and mark-up are known.
6. Correctly prepare an Income Statement.
7. Correctly complete and interpret data on inventory cards.
8. Correctly use the interest formula I = PRT and determine the value of any missing elements.

OBJECTIVES

To the satisfaction of the instructor, the students will be able to:

A. Perform operations involving algebraic expressions.

1. Classify certain algebraic expressions as monomials, binomials, trinomials and multinomials.
2. Multiply (using the horizontal or vertical form):
    a. several monomials.
    b. a monomial times a multinomial.
    c. a multinomial times a multinomial.
3. Find special products using the following shortcut methods:
    a. FOIL.
    b. the product of a sum and a difference.
    c. the square of a binomial.
4. Divide a monomial by a monomial.
5. Divide a multinomial by a monomial.
6. Find the greatest common monomial factor of multinomial.
7. Factor the greatest common monomial factor from a multinomial.
8. Factor certain trinomials into the product of two binomials.
9. Factor a "difference of two squares" into the product of two binomials.
10. Factor multinomials completely.

B. Perform graphing in the Rectangular Coordinate System.

1. Understand the concepts of a dependent and an independent variable.
2. Construct a table of values for an equation in two variables.

3. Name points in the rectangular coordinate system by used of ordered pairs.

4. Find the coordinates of a point in the rectangular coordinate system.

5. Graph an equation in two variables using a table of values.

6. Obtain information by analyzing graphs.

7. Graph linear equations by finding the coordinates of three points.

8. Graph linear equations by finding X - and Y-intercepts and one additional point.

C. Solve systems of linear equations in two variables.

1. Solve a system of linear equations in two variables by using one of the following methods:

   i. graphing.
   ii. substitution.
   iii. addition-subtraction.

2. Solve word problems by using systems of linear equations in two variables.

D. Perform basic mensuration operations in geometry.

1. Calculate the perimeter of squares rectangles, parallelograms, trapezoids, triangles and circumference of circles.

2. Find area of squares, rectangles, triangles, trapezoids, parallelograms, circles and other composite figures.

E. Perform basic operations involving basic geometric concepts.

1. Define angles, adjacent angles, vertically opposite angles, complementary angles, supplementary angles and negative angles.

2. Identify pairs of complementary angles and pairs of supplementary angles.

3. Classify angles according to size ie. acute, right, obtuse, straight angles.

4. Classify triangles and their properties according to sides ie. scalene, equilateral, right, isosceles.
5. Use the triangle angle-sum rule to calculate the size of unknown angles.
6. Use the Pythagorean theorem to calculate the length of a side in a right triangle.

ADVANCED MATHEMATICS CORE

OBJECTIVES

To the satisfaction of the instructor, the students will be able to:

A. Perform operations described in the Intermediate Level Core Units.

   1. Define real numbers, opposites, reciprocals and absolute values.
   2. Perform addition, subtraction, multiplication and division of real numbers.
   3. Perform order of operations with real numbers.
   4. Solve equations in one unknown.
   5. Manipulate formulae.
   6. Identify the properties of exponents including rational exponents.

B. Perform operations with radicals.

   1. Reduce a radical to its simplest form by employing the laws of radicals.
   2. Perform addition, subtraction, multiplication and division of radicals.
   3. Simplify radical expressions including rationalizing denominators.

C. Solve quadratic equations.

   1. Given any quadratic equation rewrite it in the form:

$$ax^2 + bx + c = 0$$

   2. Use the quadratic formula to solve a quadratic equation.
   3. Solve word problems using quadratic equations.

D. Graph linear equations and inequalities.

   1. Plot and identify points on a Cartesian coordinate system.

   2. Plot the graph of a linear equation.

   3. Plot the graph of a linear inequality.

E. Determine properties of linear equations.

   1. Given a linear equation, determine the slope and the X and Y intercepts of the line represented.

   2. Given the slope and Y intercept, determine the equation of a line.

   3. Given two points on a plane, determine:

      a. slope.
      b. equation of the line joining them.
      c. distance between them.

F. Perform operations involving variation.

   1. Solve direct, inverse and compound variation problems

      i.e. utilize the K - method

G. Solve systems of linear equations in two unknowns.

   1. Use graphs to solve systems of linear equations in two unknowns.

   2. Algebraically solve systems of linear equations in two unknowns by:

      a. elimination by substitution
      b. elimination by addition and subtraction

   3. Use Cramer's Rule to solve systems of linear equations in two unknowns.

H. Algebraically solve systems of equations in three unknowns and/or determinants.

ADVANCED BUSINESS MATH

OBJECTIVES

To the satisfaction of the instructor, the students will be able to:

A. Perform business mathematical operations.

1. Correctly determine the principal to be invested now to earn a future amount using the formula:

$$P = \frac{A}{1 + rt}$$

2. Correctly calculate interest rates per period of time using compound interest tables.

3. Correctly calculate amounts to which a given principal will accumulate at a given time using the formula:

$$A = P(1 + i)^n$$

4. Correctly calculate present value using the formula:

$$PV = \frac{1}{A(1 + i)^n}$$

or any missing elements of the formula.

5. Correctly calculate monthly installment payments, interest, amount applied to principal and loan balances.

6. Correctly use formulae and loan schedules to calculate effective annual interest rate.

7. Correctly calculate proceeds from interest and non-interest bearing notes.

8. Correctly calculate the proceeds from discounted interest and non-interest bearing notes.

9. Correctly apply rations to amounts to solve problems on partnership profits or losses and corporation dividends.

10. Perform payroll calculations.

11. Perform basic consumer math.

12. Calculate real estate mortgages using tables for reference.

13. Perform basic statistical operations including:

    a. estimation of mean, median and mode.
    b. construction and interpretation of pie and bar charts.

14. Perform operations involving sequences and arithmetic and geometric series.

ADVANCED MATHEMATICS TECHNICAL

OBJECTIVES

To the satisfaction of the instructor, the students will be able to:

A. Perform the operations in the Intermediate Technical Mathematics Unit.

B. Perform operations and solve equations involving polynomials.

   1. Calculate sum and difference.
   2. Perform multiplication.
   3. Perform division, stating restrictions.

C. Graph simple conic sections.

   1. Graph a parabola.
   2. Graph a circle.
   3. Graph an ellipse and hyperbola.

D. Perform computations involving angles.

   1. Perform basic operations in Unit E of the Intermediate Mathematics Technical Module.
   2. Define minutes and seconds as subdivisions of a degree.
   3. Add and subtract angles.
   4. Multiply and divide angles by a constant.
   5. Convert minutes and seconds to decimal degrees and vice versa.
   6. Define radian measure.
   7. Convert from degrees to radian and vice versa.
   8. Solve word problems involving calculations of arc length, sector area, linear and angular velocities.

E. Calculate primary trigonometric ratios.

1. Define the sine, cosine and tangent ratios.
2. Calculate the numberical values of the sine, cosine and tangent angles between 0° and 90° using a calculator and/or table.
3. Find an unknown side or angle in a right triangle using the appropriate trigonometric ratio.
4. Solve applied word problems including those involving angles of elevation and depression.

F. Calculate quadrant values.

1. Define unit circle to demonstrate quadrants.
2. Employing the CAST Rule identify the four quadrants and state the sine convention for trigonometric ratios for any angle in any quadrant.
3. Find the numerical value for any trigonometric ratio θ where $0° \leq \theta \leq 360°$ and/or $0 \leq \theta \leq 2\pi$.

G. Perform operations for oblique triangles.

1. Define oblique triangle.
2. Use the Law of Sines to solve for any unknown side or angle in a given triangle.
3. Determine whether the Ambiguous Case situation is applicable and consequently give two solutions for the triangle.
4. Use the Law of Cosines to solve for any unknown side or angle in a given triangle.
5. Solve appropriate word problems.

H. Perform logarithmic operations.

1. Identify the properties of logarithms.
2. Convert equations from logarithmic to exponential form and vice versa.
3. Perform change of base operations.
4. Solve appropriate word problems

I. Develop measurement computation skills.

1. Identify numbers as either exact or approximate.
2. Determine the number of significant digits in an approximate number.
3. Determine the precision of an approximate number.
4. Perform operations with approximate numbers.

BASIC SCIENCE

This course is intended for the student with little or no exposure to the language of science and technology. The intent is to develop awareness and familiarity with the language of science and the method of scientific investigation. Course content is focused on concepts which impinge on the student's daily life, which he/she frequently hears or sees. The course is meant to demystify science, correct some misunderstanding and provide a base for questioning and discovering the world around us and how it works.

OBJECTIVES

A. Recognize, understand and apply the metric system for measurement of length, capacity, volume, mass and area.

B. Demonstrate an adequate awareness and knowledge of maps and mapping as may be applied to daily activities.

1. Identify the different types of maps.
2. Identify the symbols on maps and legends and interpret their meaning.
3. Explain the scale of a map.
4. Locate and recognize the importance of a direction rose on a map.

C. Demonstrate a knowledge of some of the basic terms used in the study of nutrition, human anatomy and genetics.

1. Describe the importance of vitamins, Canada's Food Guide, fibre, fat and sugar.
2. Correctly identify organs such as brain, heart, lungs, pancreas, intestines, stomach, liver and kidneys.
3. Correctly identify and describe the role of organ systems such as nervous, circulatory, endocrine, skeletal, respiratory, digestive and reproductive.
4. Define diseases such as diabetes, heart disease, ulcers, blood pressure and headaches, bacteria, immunization and aids.
5. Demonstrate a general knowledge of genes, chromosomes, Punnett squares, dominant and recessive genes and biotechnology.
6. Identify the effects of drugs, substances, alcohol and allergies.

D. Demonstrate a knowledge of some of the basic terms used in the study of botany.

1. Define photosynthesis, respiration, deciduous, coniferous, acid rain, silviculture and conservation.
2. Demonstrate an awareness of environmental issues and their economic significance such as acid rain, pesticides, fertilizers and nutrient cycling.

E. Recognize and identify some of the basic terms used in the study of mechanics, electricity, magnetism, power, nuclear power and energy.

F. Demonstrate a knowledge of basic environmental issues.

1. Explain the effects of air pollution, acid rain, noise pollution, ozone, waste management, recycling, soil erosion, land use management, catalytic converters, leaded vs unleaded fuels, road salt, nuclear industry and desert encroachment.

G. Demonstrate a knowledge of some of the basic terms used in the study of resources.

1. Explain the concepts renewable and non-renewable resources, fossil fuels, conservation, mining, geothermal, solar, wind, nuclear and tidal energy, hydro electricity and wildlife conservation.

H. Demonstrate a knowledge of some of the basic terms used in the study of matter and atomic theory.

1. Describe properties of matter, states of matter, changes of state, structure of matter, the law of conservation of matter and the atomic model.

I. Demonstrate a knowledge of some of the basic terms used in the study of technology.

1. Define basic technological terms such as insulation, R-value, etc.
2. Identify the issues associated with insulation, x-rays, nuclear reactors, microwaves, cruise missiles, supersonic jets, fluorescent lighting and irradiated food.

INTERMEDIATE SCIENCE CORE

OBJECTIVES

Upon completion of this course, the student will be able to:

General Science

A. Explain the concept of Science.

1. Define scientific terms such as science, chemistry, biology and physics.
2. Summarize the scientific method and be able to apply it in solving a variety of problems.
3. Identify lab equipment.
4. Write a model of a lab report.
5. Follow/obey all lab safety procedures.
6. List a minimum of three appropriate reasons for studying science.

Chemistry

B. Explain what matter is.

1. Define terms related to matter such as condensation, sublimation, solid, elements, compounds and mixture.
2. Draw and correctly label a change of state diagram.
3. Safely perform and prepare lab reports for experiments.
4. State the assumption of the Kinetic molecular theory of matter.
5. Classify matter as homogeneous/heterogeneous and metal/non-metal.
6. Compare the three states of matter according to volume, shape and compressibility.
7. Distinguish between physical and chemical properties and physical and chemical changes.

C. Explain what an atom is.

1. Define terms related to the atom.
2. Write chemical symbols for elements and name elements given chemical symbols for a minimum of 25 elements.
3. Draw and label a Bohr diagram of any five of the first elements.
4. Compare the three main components of an atom.
5. Distinguish between ionic and covalent bonding by giving two examples of each.
6. Write chemical formulas for each of the following: water, carbon dioxide, carbon monoxide, table salt, sugar, sodium bicarbonate (baking soda), calcium carbonate (chalk).

D. Explain what water is.

1. Define terms related to water such as water, freezing point, boiling point, solvent, etc.
2. Perform experiments related to water such as electrolysis and synthesis; prepare a lab report for each experiment.
3. Discuss the significance of water for life.
4. List five characteristics of water.

E. Explain what solutions are and identify their characteristics.

1. Define terms related to solutions such as solute, solvent, solution, solubility, etc.
2. Compare the different types of solutions and give examples of each.
3. List five characteristics of solutions.
4. Select solutions from a given list.
5. Prepare solutions such as table salt solution, sugar solution, alcohol/water solution; prepare a lab report for each experiment.
6. Plot and interpret a solubility curve.

F. Explain what acids and bases are and identify their characteristics.

1. Define terms related to acids and bases such as acid, base, neutralization.

2. List five examples of acids and bases encountered in everyday life.

3. Identify a minimum of three characteristics of acids and of bases.

4. Perform experiments to illustrate neutralization, characteristics of acids and bases; prepare a lab report for each experiment.

Biology

G. With the aid of a microscope, explain what a cell is.

1. Define terms related to the microscope and the cell.

2. List six characteristics of living things.

3. Operate a microscope and label its parts.

4. Perform experiments to prepare and study microscopic slides of plant and animal cells; prepare lab reports for all experiments.

5. Distinguish between plan cells and animal cells.

6. Draw and label diagrams for plant and animal cells.

H. Explain the cell reproduction process.

1. Define terms related to cell reproduction such as chromatin, chromosomes, chromatial genes, multicellular, unicellular, tissue, organ, organ system, etc.

2. Draw diagrams of the four stages of mitosis and explain what happens at each stage.

3. Study the four stages of mitosis under the microscope and using films and videos.

Digestion and Nutrition

I. Explain the concept of nutrition and how it affects our health.

1. Define terms related to nutrition such as vitamins, nutrition, balanced diet, etc.
2. List a minimum of three basic nutrient requirements of the human body, other than vitamins and minerals.
3. List a minimum of five vitamin and five mineral requirements of the human body.
4. Describe a minimum of one function for each of the vitamins and minerals listed.
5. Identify the best sources for vitamins and minerals listed.
6. Identify a minimum of three acceptable nutritional practices.
7. Identify a minimum of three reasons for following recommended nutritional practices.
8. List the five main food groups according to Canada's Food Guide.

J. Explain the digestion process in relation to the human body.

1. Define terms related to digestion such as digestive system, organ and enzymes.
2. List and describe the function of the organs of the digestive system.
3. Correctly label a minimum of 12 parts on a diagram of the digestive system.
4. List the enzymes required for digestion of proteins, carbohydrates and fats.

Ecology

K. Explain the processes of photosynthesis and respiration.

1. Define terms relevant to photosynthesis and respiration such as oxygen, carbon dioxide, glucose, catalyst and chlorophyll.

2. Provide examples that illustrate the importance of photosynthesis to human life.

3. Explain the significance of the conversion of solar energy to potential energy which can be stored.

4. Describe the process of photosynthesis and identify where it occurs.

5. Describe the process of respiration and identify where and when it occurs.

6. List four factors essential for the photosynthetic process.

7. Draw and correctly label a diagram indicating the raw materials and products of photosynthesis.

8. Write the foreword equation for photosynthesis.

9. Define terms relevant to ecology such as flora, fauna, habitat, niche and ecosystem.

10. Correctly draw and label a schematic diagram to illustrate the water cycle.

11. Describe the role of the sun as an energizer in wind and water erosion.

12. Apply Newton's Third Law to illustrate the balance of nature as a form of elastic equilibrium.

13. Define and explain a food chain.

14. Draw a food web.

15. Identify and describe ecological problem areas such as air pollution, water pollution and noise pollution.

16. Analyze the ecological impact resulting from nuclear hydro and fossil fuel energy production; propose possible solutions to these problems.

17. List natural phenomena which alter our environment and describe their environmental impact.

18. Describe notable historical effects for a minimum of three natural phenomena which alter our environment.

Circulation and Respiration

L. Explain the human circulation and respiration processes.

1. Define terms related to circulation and respiration such as vein, artery, lung, heart, alveoli and bronchi.

2. Correctly label a minimum of 8 parts on a diagram of the heart.
3. Trace the flow of blood through the circulatory system.
4. With respect to their origin, function, shape and size compare in chart form, red blood cells, white blood cells; platelet and plasma.
5. Correctly label a minimum of 6 parts on a diagram of the respiratory system.
6. Differentiate between breathing and respiration.
7. Describe the function of the diaphragm in the breathing process.
8. Describe how the expansion and contraction of the chest cavity makes breathing possible.
9. Compare the composition of inhaled air with exhaled air and explain the differences and why they occur.
10. List and discuss a minimum of 3 diseases/malfunctions of the circulatory and respiratory systems.

Heat

M. Explain the concept of heat.

1. Define terms related to heat such as heat, temperature, conduction, convection, radiation and R-value.
2. Explain how heat travels and provide examples.
3. List a minimum of 5 sources of heat energy and explain how to prevent transfer of heat energy/R-value.
4. State the assumptions of Kinetic molecular theory.
5. Perform experiments on expansion of solids, heat exchange, power of a heater, specific heat capacity of various liquids, specific latent heat of fusion and of vaporization; prepare lab reports for each experiment.
6. Explain change of state, fusion and vaporization.
7. Manipulate the heat formulae and solve for each factor.
8. Solve a variety of problems on conversion of Kelvin to Celsius and vice versa, power and heat energy, specific heat capacity of various substances, latent heat of fusion and of vaporization using correct units.

Light

N. Explain the theory of light.

1. Define terms related to light such as optics, plane mirrors, curved mirrors and lenses.
2. List a minimum of 4 sources of light energy.
3. Perform experiments on shadows, plane mirrors, curved mirrors, lenses, refraction, dispersion of white light and the pin-hole camera; prepare lab reports for each experiment.
4. State the laws of reflection and of refraction.
5. Compare the converging mirror and lenses with the diverging mirror and lenses, with respect to name, action, focus type, image produced and practical application.
6. Manipulate th light formulae and solve for each factor.
7. Discuss optical instruments and light; compare the human eye with the modern camera and list the vision defects and how to correct them.
8. Solve a variety of problems on speed of light, curved mirrors, lenses, focal length formula and index of refraction expressing answers in the correct units.

Magnetism

N. Explain magnetic theory.

1. Define terms relevant to magnetism such as force, pole, line of flux and domain theory.
2. Conduct an experiment to map the lines of flux in the magnetic field on a bar and/or horseshoe magnet; prepare lab reports for each experiment.
3. Identify the 4 characteristic lines of flux.
4. Name a minimum of two diamagnetic substances, two ferromagnetic substances and two paramagnetic substance.
5. Conduct an experiment to construct a magnet; prepare lab report for experiment.
6. Describe the earth as a magnet with its own magnetic field.

7. Use a magnetic compass and apply proper correction for dedication and indication.

8. Describe some applications of magnetic principles in accelerators, medical diagnostics, geophysics, etc.

9. Describe the relationship between magnetic field and electric currents.

Sound

O. Explain sound theory.

1. Define terms relevant to the study of sound such as condensation, rarefaction, amplitude, pitch, frequency, supersonics and ultrasonic.

2. Demonstrate correct use of pertinent formulae and units.

3. Describe the propagation of energy by longitudinal waves.

4. Correctly label a diagram to illustrate the parts of a longitudinal wave.

5. List the variables which determine the velocity of sound.

6. Conduct an experiment to determine the velocity of sound in the air at a given temperature; prepare a lab report for the experiment.

7. Identify the applications of sonics, ultrasonics and supersonics such as stereos, medical diagnostics and pulverization.

Machines

P. Demonstrate a basic understand of the terminology and operation of simple machines.

1. Define terms related to machines such as simple machines and torque levers.

2. List a minimum of 5 simple machines and describe their functions.

3. With reference to fulcrum, resistance and effort describe each of the three classes of levers and provide examples of each.

4. State the law of the lever and explain it's mathematical form.
5. Using correct units, solve problems using the law of the lever.
6. Perform a minimum of one experiment for each class of lever; prepare lab reports for each experiment.
7. Calculate the mechanical advantage of machines.
8. Solve qualitative problems which demonstrate the practical applications of machines such as the wedge and the screw.

Density and Specific Gravity

Q. Explain density and gravity and their effects.

1. Define terms related to density and specific gravity such as density, specific gravity, mass and hydrometer.
2. Use formulas to calculate the density and specific gravity of liquids and solids.
3. Perform a minimum of 3 experiments to determine/compare density and specific gravity of liquids and solids; prepare lab reports for each experiment.
4. Solve qualitative problems which demonstrate the practical application of density and specific gravity such as battery, anti-freeze and milk testing.

Current Electricity

R. Understand current electricity and how it operates.

1. Define terms related to current electricity such as current, voltage, resistance, Ampere, ohm, volt and Watt.
2. List a minimum of 4 sources of electrical energy.
3. State and compare the 3 factors of electrical currents (current, voltage, resistance), units and symbols.
4. Draw and label with correct symbols a schematic diagram of a simple electrical circuit.
5. With respect to current, voltage and resistance compare series and parallel circuits using correct units.

6. Perform a minimum of three experiments to demonstrate electrical principles such as Ohm's law, series circuits and parallel circuits; prepare lab reports for each experiment.

7. Solve for each factor in a given electrical formulae such as Ohm's law.

8. Solve problems on Ohm's law, series circuits, parallel circuits and series/parallel combinations using correct units.

Static Electricity

S. Explain the concept of static electricity.

1. Define terms relevant to static electricity such as electron, proton, electroscope and induction.

2. Conduct a minimum of four contact and induction experiments to create a positive or negative charge on an electroscope; prepare lab reports for each experiment.

3. Provide and compare examples of conductors and insulators.

4. Explain why static electricity is a problem i.e. lightning and rollers in pulp mills.

5. Explain how static electricity can be useful i.e. safety in an electrical storm, breakdown of dioxin and electronic air cleaners.

Introduction to Mechanics

T. Explain basic mechanical theory.

1. Define terms related to introductory mechanics such as force, energy, motion, acceleration and speed.

2. Explain the terms scalene quantity and vector quantity and provide a minimum of two examples for each.

3. Using correct units, solve problems which require the use of formulae such as:

$$P = ST \quad \text{and} \quad A = \frac{V_f - V_o}{t}$$

4. Conduct a minimum of one experiment using distance, speed and acceleration; prepare a lab report for the experiment.

5. Explain the difference between balanced and unbalanced force and provide examples of each.

6. State Newton's three laws and provide two examples for each.

7. Perform a minimum of one experiment for each of Newton's laws; prepare a lab report for each experiment.

8. Explain the difference between kinetic and potential energy and provide a minimum of two examples for each.

9. State the Law of Conservation of Energy.

10. Using correct units, solve word problems for force, power and energy.

11. Perform a minimum of two experiments related to energy and power; prepare lab reports for each experiment.

CHEMISTRY ADVANCED

OBJECTIVES

A. Perform basic mathematical operations.

   1. Perform the mathematics necessary for its application to chemistry, such as formula manipulation.

B. Perform basic metric operations.

   1. Understand the Metric system and the use of measurement as it applies to chemistry.

C. Explain the basic concepts of matter.

   1. Describe the classification and properties of matter.
   2. Describe components of matter, such as elements, atoms, compounds, formula units and molecules.

D. Explain the basic structure of the atom.

   1. Describe Dalton's Atomic Theory.
   2. Describe the three basic subatomic particles and their properties.
   3. Describe the arrangement of electrons around the nucleus.

E. Describe the periodic classification of the elements.

   1. Explain periodic law.
   2. Describe the characteristics of the periods and groups of the periodic table.

F. Describe the characteristics of compounds.

   1. Describe and calculate oxidation numbers.
   2. Describe the chemical bond.

3. Demonstrate how to use the periodic table to predict properties, formulas, etc. of compounds.

G. Explain the nomenclature of inorganic compounds.

1. Describe the system for naming inorganic compounds.
2. Describe the formulas for inorganic compounds.

H. Perform chemical calculations.

1. Describe and calculate formula and molecular masses.
2. Describe and calculate the mole.

I. Interpret chemical equations.

1. Describe and balance chemical equations.
2. Describe the types of chemical reactions.
3. Describe reaction rates.
4. Describe chemical equilibria.

J. Describe the properties and characteristics of gases and make calculations related to pressure and volume.

1. Describe the properties of gases.
2. Describe and calculating the gas laws.

K. Describe the properties and charateristics of solutions.

1. Describe and calculate the different types of solutions, such as acids, bases and ionic solutions.

L. Explain the basics of organic chemistry.

1. Distinguish between inorganic and organic chemistry.
2. Describe the role of carbon in organic compounds.
3. Describe various examples of organic families, such as hydrocarbons, and some of their derivatives.

ADVANCED BIOLOGY

OBJECTIVES

A. Explain the basics of life.

1. Describe and give examples of the characteristics of life.
2. Describe and give examples of the problems necessary for the survival of life.

B. Explain the chemistry pertaining to life.

1. Describe the chemicals rudiments of life, such as elements, atoms, proton, neutron, electron, atomic number valance, ions, molecule, reactions, energy, solutions and pH.
2. Demonstrate why certain elements are necessary for life; such as trace elements, organic molecules, polarity and hydrogen bonds.
3. Describe the nature of and types of macromolecules found in living systems; such as protein, enzyme, DNA, RNA, lipid and carbohydrate.

C. Explain cell form, function and energetics.

1. Describe the generalized structure of the eucaryotic cell and its organelles.
2. Demonstrate the importance of cell membranes to the life of the cell utilizing osmosis, diffusion, and membrane transport.
3. Describe the basic energy transformations that occur in organisms such as aerobic and anaerobic reactions, phosphorylations, and ATP.
4. Demonstrate the importance to the cell and organism of photosynthesis, anaerobic and aerobic breakdown of organic molecules.
5. Demonstrate the significance of cell specialization.

D. Explain the process and significance of cell replication.

1. Describe mitotic cell division and the function(s) served by mitotic cell division in most multicellular and unicellular organisms.
2. Describe the cell cycle and the importance of its stages.
3. Describe meiotic cell division and its role in sexual reproduction.
4. Distinguish between mitotic and meiotic cell division.

E. Explain homeostasis and its significance in human physiology.

1. Describe the basic anatomy of an organism and dissect an organism.
2. Describe the path of digestion and it significance in nutrition and it humans anatomical structures.
3. Describe the process of gas exchange, its significance to the human organism and its anatomical structure.
4. Describe the structures and function of the internal transport system of the human body.
5. Describe chemical regulation inside the human body.
6. Describe the human nervous system, its receptors and the actions of neurons and nerve impulses.
7. Describe the components of the human endocrine system and the role of their secretions in regulating body activity.

F. Describe the process of reproduction and its significance to the human species.

1. Describe sexual reproduction and the life cycle of organisms that rely on sexual reproduction.
2. Describe the process of gamete formation and the appropriate organs.
3. Describe the events and associated anatomy of conception, pregnancy and childbearing.
4. Describing the various methods of avoiding pregnancy.

G. Explain genetics and its significance to human heredity.

1. Describe the concepts of Mendelian genetics.
2. Describe the basics of human heredity.

OBJECTIVES

A. Review basic mathematical operations.

  1. Perform the mathematics necessary for applications such as formula manipulation.

B. Review basic metric operations.

  1. Describe the Metric system and the use of measurement as it applies to physics.

C. Explain the basics of motion.

  1. Distinguish between scalar and vector quantities.
  2. Distinguish between distance and displacement, speed, velocity, and acceleration.
  3. Describe uniform motion.
  4. Calculate problems relating to uniform motion.
  5. Describe accelerated motion.
  6. Calculate problems relating to accelerated motion.

D. Explain force and solve associated word problems.

  1. Describe force, gravitational force, work and power.
  2. Calculate word problems relating to force, gravitational force and pressure.

E. Discuss work, energy and power, and solve associated word problems.

  1. Describe work.
  2. Describe energy, such as kinetic and potential energy and the conservation of energy.
  3. Describe the relationship between work, energy and power.
  4. Solve problems involving force and displacement to determine work done.

5. Solve problems involving work and time to calculate power.

F. Distinguish between heat and temperature.

1. Change temperature readings within Fahrenheit, Celsius and Kelvin.

2. Describe calorie, BTU and joule.

3. Perform calculations involving heat of fusion and heat of vaporization of water.

4. Define specific heat exchange between two or more bodies.

5. Describe methods of heat transfer.

G. Explain energy in waves and the relationship to sound and light.

1. Describe the properties and behaviour of waves.

2. Describe the production and properties of sound waves.

3. Describe interference in sound waves.

4. Describe light rays.

5. Describe the affect of mirrors and lens on light rays.

H. Explain electric energy and make calculations relating to electric currents.

1. Differentiate between conductors, insulators and semiconductors.

2. Describe different methods of obtaining static charges, such friction, contact and induction.

3. Describe the characteristics of current electricity and electric circuits, such as series and parallel circuits.

4. Solve problems involving series circuits, parallel circuits and electrical cost.

I. Explain magnetism and electromagnetism and its application to electric motors and generators.

1. Describe the concepts of magnetism such as domain theory, induced magnetism and poles.

2. Describe the concepts of electromagnetism and electromagnetic induction.

3. Determine the direction of induced current in a simple generator.

4. Determine the direction of conductor movement in a simple motor.

5. Distinguish between an AC and DC generator.

COMPUTERS

This course is designed to accommodate individual training plans. i.e. Basic level students with limited ability to read and follow instructions might be suited to the CAL packages only. Students who have sufficient language skills could begin with the theory component, followed by keyboarding skills and progress to either word processing, and/or spreadsheet applications.

OBJECTIVES

I. THEORY

A. Demonstrate a knowledge of common computer hardware components.

1. Define the term hardware.
2. Explain the terms input, output, processing and operating system.
3. Identifv computer output devices such as screen, printer, tapes and disks.
4. Identify computer input devices such as keyboard, tape and disk drive.

B. Demonstrate a knowledge of common computer software.

1. Define the term software as a non-resident program.
2. List common software applications such as word processing, spreadsheets, data bases, financial, graphics, games and engineering.
3. Provide examples of commercial products for some of the common applications.

C. Recognize the interdependent relationship between hardware and software.

D. Define common computer terms such as bytes, bits, RAM, ROM, K, data, menus, interface, CPU and DOS.

II. KEYBOARDING

E. Identify and describe the use of the different parts of the keyboard such as numeric keys, alphabetic keys and function keys.

F. Develop keyboarding skills through the use of computer software packages.

G. Upon completion of the course, type a minimum of 10 w.p.m. with accuracy.

III. APPLICATIONS

H. Access and operate a Word Processing application system.

1. Call up a word processing program.
2. Demonstrate the ability to run the following w/p program features to:
    - a. input.
    - b. edit.
    - c. format.
    - d. save.
    - e. retrieve.
    - f. produce a hard copy.
3. Produce a minimum of 2 acceptable documents such as memos, letters and reports.

I. Access and operate a Spreadsheet and Data Base application system.

1. Call up the program.
2. Demonstrate the ability to use the following spreadsheet/data base features to:
    - a. input.
    - b. edit.
    - c. format.
    - d. save.
    - e. retrieve.
    - f. produce a hard copy.
3. Produce a simple one screen worksheet which will perform simple mathematical operations on rows and columns.

4. Construct a 10 to 15 record, 5 field data base and produce a hard copy based on a one field sort/extraction.

J. Access and operate CAL systems.

1. Call up programs such as math, English, science.
2. Read directions on the screen.
3. Make a selection from a menu.
4. Access and read help screens.
5. Exit from the program.

HANDS-ON

Where appropriate, students will identify and use vocabulary and tools specific to the occupations identified in the personal profile and career path.

OBJECTIVES

A. Identify generic occupational skills and vocabulary through skills orientation in labs, shops and classrooms.

   1. Operate occupation-specific hand tools, fixed and portable power tools.
   2. Demonstrate occupation-specific reading skills such as blueprints, graphs or manuals.
   3. Use measuring devices such as scales, gauges and meters.
   4. In industrial and trade occupations apply geometry to areas such as plumbing, carpentry, sheet metal work, mechanics and electrical wiring.

B. Experience simulated work environment conditions.

   1. Participate in tours to work sites.
   2. Participate in simulated experiences through "work stations", i.e. Singer, Val par and COATS.
   3. Participate in job shadowing, informational interviews and/or work placements.
   4. Participate in skills orientation and/or training in college shops, labs or classrooms.
   5. Identify occupationally related resources such as trade magazines and speakers.

C. Demonstrate a knowledge of work place safety practices.

   1. Observe, discuss, read about and research safety practices.

D. Demonstrate increased self-confidence with occupational skills and vocabulary.

E. Complete a pre and post component self-evaluation check list.

WORK ADJUSTMENT

The Work Adjustment course is composed of three separate sections: Work Adjustment, Vocational Assessment and Job Search. Skills are required in all these areas but the time spent in any one area could vary with the individual needs.

OBJECTIVES

I. WORK ADJUSTMENT

A. Demonstrate a knowledge and understanding of individual rights and responsibilities in the work place.

1. Participate in discussions, presentations, speaker sessions, interviews, role plays, research activities, seminars and workshops.
2. Describe the legal rights and responsibilities of employees and employers.
3. Describe how work place harassment affects an employee and employer.
4. Explain how performance reviews are used in the work place.
5. Explain how legislation such as the Ontario Human Rights Code, the Ontario Employment Standards Act, the Ontario Occupational Health and Safety Act, the Ontario Worker's Compensation Policies and the Canadian Bill of Rights affects employees and employers.
6. Describe the role of employee organizations such as unions.
7. Explain the fundamental uses of contracts policies and employment equity.

B. Demonstrate problem solving and decision making skills in the work place

1. Participate in discussions, presentations, role plays, seminars, workshops and speaker sessions.
2. Explain the problem identification process and how it can be a challenge.
3. Describe techniques used in the generation of solutions to problems such as brainstorming.
4. Identify the process of setting criteria for decision making.

5. Explain the process of selecting and implementing solutions.

6. Explain how to review and assess the effectiveness of decisions.

C. Demonstrate personal skills in the work place such as self-development and interpersonal skills development.

1. Participate in activities that cause reassessment of values and lifestyle.

2. Develop coping strategies for dealing with change, stress and time management.

3. Participate in activities that develop organizational skills.

4. Describe how employee and employer attitudes and performance affect the work environment.

5. Develop effective listening skills through activities which require individuals to:

   a. give, receive and follow instructions.
   b. give and receive feedback and suggestions.
   c. be critical and evaluate thinking.
   d. identify barriers to interpersonal communications.
   e. question for clarification.
   f. present oral reports.
   g. analyze non-verbal and meta messages.

6. Participate in activities that utilize group dynamics.

7. Describe assertiveness and conflict management.

II. VOCATIONAL ASSESSMENT

A. Develop a personal profile.

1. Identify personal interests, aptitudes, learning styles and transferable skills, using such as microcomputer evaluation systems assessment such as Strong-Campbell, Career Assessment Inventory, Choices and Career Factory.

2. Compile data obtained using the various assessment tools.

3. Assess the data obtained in relation to individual circumstances.

B. Develop a career path.

1. Identify and utilize occupational research methods.
2. Apply occupational research methods to data from the personal profile.
3. Identify and utilize goal setting strategies.
4. Use personal profile and occupational research to establish short-term and long-term goals to reach career objectives.

C. Based on the information gathered through the personal profile and occupation research, structure an Individual Training Plan with the assistance of OBS personnel.

III. JOB SEARCH

A. Plan and prepare for a job search.

1. By completing inventories, assess traits and skills.
2. Identify the elements of effective resumes, covering/ follow-up letters and letters of application.
3. Prepare and complete a resume and sample letters.
4. Practice completion of sample application forms and apply knowledge of the Human Rights Code.
5. Through discussion and role play identify job interview skills and behaviour including:
    a. determining job descriptions.
    b. researching companies.
    c. rehearsing possible questions and answers.
    d. recognizing appropriate dress code.
    e. projecting a positive image.
    f. concluding the interview.
6. Develop effective telephone skills through practical applications.

B. Organize and structure a Job Search.

1. Perform company/employer research.
2. Locate job vacancies.
3. Conduct informational interviews.

4. Set up a log system to track a job search.
5. Arrange and utilize volunteer and work placement experiences.

C. Implement job search techniques.

1. Utilize services such as private and public employment agencies, union halls, Yellow Pages, trade magazines, newsletters, classified ads, public libraries, schools and college placement agencies.
2. Establish and/or use job networks, buddy systems and community contacts.
3. Contact prospective employers.
4. Participate in follow-up interviews using written/verbal methods.

APPENDIX 12

FBO TERMINAL AND ENABLING OBJECTIVES

Development of Terminal Objectives
for the
Formation de base de l'Ontario (O.B.S.)
Joint Project (draft)

Colleges - Algonquin
- Cambrian
- Northern

LEARNING how to LEARN *

* These Performance Objectives reflect those delivered at the lower end of the Basic Level. In FBO, this level is referred to as Learning How to Learn.

This section is a translation of the report prepared by each of the FBO groups which developed the content.

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Note: We did not address the lower end of the basic level because our working group did not have the expertise. We are informed that the Ministry of Skills Development will allow a committee to address our needs.

We take this opportunity to thank the Ministry for making it possible for the FBO program faculty to come together and identify our most pressing needs.

We defined the different groups of illiterates and classified them into four categories: complete, semi-functional, functional and educated illiterates.

1 - **Complete Illiterate**

- A person incapable of reading or writing

2 - **Semi-functional illiterate**

- A person can decode words but does not understand simple and brief statements pertaining to daily lives.

3 - **Functional illiterate**

- A person who can decode a written message but cannot understand it. As for the correct delivery of a written message, he/she is limited almost exclusively to reproduction.

4 - **Educated illiterate**

- A person who has a college diploma but communicates at the semi-functional or functional level.

To stop this social problem, we have to play a double role with this clientèle by offering them:

1) education: allow them to acquire basic knowledge in a learning environment.

2) training: enable them to acquire work-related skills.

Overall Objective

LEARNING how to LEARN

We have recognized the following categories

A) Understand how society works (work place adaptation)

B) Oral communication

C) Development of reading skills

D) Writing skills and understanding complex ideas

E) Mastery of a certain level of mathematics

The objectives must develop basic skills in the mother tongue, French.

TERMINAL OBJECTIVES

ADAPTATION TO THE ENVIRONMENT

Personal Development

- to encourage the adult to identify his/her academic needs and/or functional needs
- to allow the adult to gradually adapt to his/her environment and to his/her learning environment
- to make or renew contact with content and work methods
- to explore the resources of the environironement
- to establish objectives to develop his/her learning program
- to identify his/her learning style and get to know the adult learning environment
- to become aware of his/her learning experiences and knowledge in relation to the environment
- to identify the different moments of his/her life that contributed to or injured his/her personal development
- to become aware of the findings accomplished since starting literacy
- to allow the adult to know and use techniques which facilitate time management and personnal organization in order to establish relations between personal management and the learning processes

Social Development

- to develop group work
- to acquire and develop a behaviour that facilitates group work
- to develop a critical reflection on the information received

LEARN HOW TO COMMUNICATE BASIC SKILLS IN HIS/HER MOTHER TONGUE

I) Develop techniques that facilitate the acquisition of reading and writing habits

- to recognize and reproduce the letters of the alphabet in lower and upper cases
- to recognize and reproduce graphic signs other that letters
- to recognize and reproduce words, sentences and short passages meaningful to the adult
- to recognize the usefulness of the alphabet's order
- to classify in alphabetical order
- to group words of the same morphological family
- to learn how to use the dictionary
- to identify the different services offered by the library

II) Identify the nature of the principal components of the French language in order to transfer them while reading and writing

- to distinguish between vowels and consonants
- to conceptualize what a word is
- to identify a syllable as part of a word
- to separate words in syllables
- to group syllables in word(s)
- to understand the role of punctuation (period, comma, question mark and exclamation mark)
- to recognize the nature of words (noun, verb, adjective, object and pronoun)
- to distinguish the types of words (common and proper nouns), their gender and number

III) Understanding the rules that govern grammatical functions in order to apply them in writing situations and to better interpret reading

- to distinguish the main functions of the subject, the verb, the object and the adjective

IV) Discover the nature and function of words in order to include the grammatical spelling in communication

- to express the general rule for the formation of the feminine
- to know the feminine of words of active vocabulary and which are completely different from the masculine
- to observe certain words which are the same in both the masculine and feminine
- to express the general rule of the plural
- to explain the gender and number of a word with the object
- to develop habits concerning the agreement of the verb with its subject
- to develop habits regarding the agreement of the adjective with its subject

V) Interpret the meaning of a sentence in order to correctly write certain homophones

- to observe the spelling differences between principal homophones
- to apply different homophones in a writing situation
- to discover and understand the contextual meaning of certain words within communication situations

VI) Conjugate verbs in order to communicate correctly

- to recognize the time of an action within a sentence
- to learn how to conjugate verbs at the indicative, the present, the past, the imperfect and future, the imperative (present) and the conditional (present) tenses

VII) Identify the different components of a written message in order to transfer them in written communication

- to understand the different tones of speech
- to identify the different types of sentences
- to write simple sentences
- to identify the principal idea of a message
- to write short passages meaningful to the adult

VIII) Acquire the knowledge and skills needed to read fluently

- to identify the different written forms of a sound
- to plan a time for reading out loud
- to re-establish the logical order of the words of a sentence
- to re-establish the logical order of groups of words within a sentencce
- to re-establish the logical order of a passage
- to observe the role of the period (period, question mark, exclamation mark), the comma and the upper case
- to read for a purpose
- to understand the meaning of words according to their context
- to distinguish fiction from reality
- to distinguish a fact from an opinion

- to situate the action in time
- to pick up the primary and secondary ideas
- to understand a written order
- to rewrite a written order
- to write an order

IX) Establish a terminology bank in order to broaden the known vocabulary

- to acquire an active vocabulary of two thousand words
- to know the meaning of these words
- to correctly write these words
- to use these words in spoken and written sentences
- to replace some of these words by synonyms
- to associate these words (by morphological family, ending, nature)
- to create new words by adding prefixes and suffixes

X) Identify the different components of speech in order to communicate actively

- to discover the characteristics of spoken communication
- to develop listening and communication techniques by observing the role of the transmitter and the receiver
- to practice speech in spoken situations in relation to one's experiences and concerns

Master a certain level of knowledge in mathematics

I) Master whole numbers

- to recognize numbers
- to distinguish between an even and an odd number
- to identify the symbols of basic operations (+ - x -   = =)
- to use the terminology related to the four basic operations
- to recognize the value of a digit within a number
- to write a number in digits and letters
- to round off a number
- to do the four basic operations

II) Do the four basic operations on decimal fractions

- to identify the relative nature of a digit within a decimal fraction
- to compare decimal fractions by using the symbols (=)
- to round off decimal fractions
- to add decimal fractions
- to substract decimal fractions
- to multiply decimal fractions
- to divide decimal fractions
- to solve written problems related to daily life by using the addition, substraction, multiplication and division properties of decimal fractions

III) Understand and apply basic concepts related to ordinary fractions

- to identify the numerator and denominator of a fraction
- to distinguish between simple and complex fractions
- to find the equivalent of a fraction
- to reduce a fraction to its simplest form
- to compare ordinary fractions

IV) Introduce basic concepts related to percentage

- to convert a percentage to decimal fractions and ordinary fractions
- to calculate the percentage of a number
- to solve written problems related to daily life by using the concept of percentages

V) Introduce different units of the metric system

- to measure with instruments the length, mass and volume of some bodies
- to read the temperature with a thermometer
- to measure time
- to solve written problems by using different units of the metric system

WORK ADAPTATION

INTRODUCTION

This document pertains to sessions other than Career Planning seeing that these have to be given by a member of the counselling office certified to administer tests.

During the orientation, the animator chooses the workshops that satisfy the needs of the participants.

We have not formulated objectives, but rather give a list of all possible subjects. A team of animators will have to deal with the development of precise objectives and appropriate learning material in the near future.

SUBJECTS

I Personal growth

II Communication

III Problem solving

IV Work

V Career planning

PERSONNAL GROWTH

1 - Self-awareness

- Interests/values

- Attitudes/behaviours

- Strengths/limits

2 - Self confidence

3 - Assertiveness

4 - Organizational behaviour
  - time management
  - work methods

5 - Change adaptation
  - health/stress management

COMMUNICATION

Active listening / Spoken and non spoken communication

- Message

- Discussion

- Positive and negative feedback
- Conflicts

PROBLEM SOLVING

1 - Problem identification
2 - Brainstorming for solutions
3 - Evaluation of solutions
4 - Choosing a solution
5 - Application of the solution
6 - Evaluation of results

WORK

1 - Employer/employee rights and job security
2 - Job search
3 - Job applications
4 - Interview techniques
5 - Employee behaviour/Employer expectations

References - Ontario Human Rights Code
- Ontario Employment Standards Act
- Ontario Occupational Health and Safety Act
- Workers' Compensation Board
- Canadian Human Rights Chart

CAREER PLANNING

- That a qualified person (of the counselling office) be responsible to the Career Planning Section which comprises the administration of tests.

- We suggest an approximate length equivalent to 25% of the total hours.

Development of Terminal Objectives

for the

Formation de base de l'Ontario (O.B.S.) *

Joint Project (draft)

Colleges - Algonquin
- Cambrian
- Northern
- St-Lawrence
- Sault-Ste-Marie (Chapleau Campus)

* Explanatory Note:

These TPOs reflect those delivered at the upper end of the Basic Level through to and including the Advanced Level of FBO.

F.B.O. (O.B.S.) Learner's Progress

PERSONAL/PROFESSIONAL ORIENTATION

CURRICULUM GUIDELINE

BASIC / INTERMEDIATE / ADVANCED LITERACY

- Other Upgrading Programs
- Work Market

- Other Skills Development Programs

ORIENTATION

I Developing the learner's profile
II Making a realistic career choice
III Developing an individual curriculum

- Guiding the student so he/she can choose from the course objectives, the ones that are necessary according to his/her personal and/or professional orientation.

TERMINAL OBJECTIVES

COMMUNICATIONS - FRENCH

BASIC LEVEL

Preambule:

- In a literacy program, the learner has to reach the preliminary objectives at the basic level.

TERMINAL OBJECTIVES

I LISTENING SKILLS

- Remember, write and forward a verbal message
- Understand and follow effectively verbal instructions

II SPEAKING SKILLS

- Communicate clearly, logically and effectively within a discussion, a presentation or a conversation

III READING SKILLS

- Read in hushed voice technical texts of interest and general material oriented towards skills and professions
- Understand technical texts of general interest related to skills and professions
- Evaluate technical texts of general interest related to skills and professions

IV WRITING SKILLS

- Write paragraphs
- Fill in many types of forms, especially those related to employment

SUB-OBJECTIVES

I. LISTENING SKILLS

I.1 Remember, write and forward a verbal message

- Recognize the key words
- Distinguish between main and secondary ideas and examples
- Retain the main ideas
- Repeat a message exactly

I.2 Understand and follow effectively verbal instructions

- Retain and understand key words
- Retain the order of given verbal instructions
- Establish a plan to perform the instructions

II. SPEAKING SKILLS

II.1 Communicate clearly, logically and effectively within a discussion, a presentation or a conversation

- Organize one's own ideas
- Distinguish a definition from an example
- Use appropriate vocabulary
- Express oneself using complete sentences
- Express oneself in a simple and brief way
- Articulate well
- Answer questions with precision
- Formulate questions well

III. READING SKILLS

III.1 Read in hushed voice technical texts of general interest related to skills and professions

- Recognize a group of words quickly
- Pronouce acronyms and abbreviations correctly
- Link up words
- Recognize and respect punctuation marks
- Establish a good reading rythm
- Know how to read expressively
- Read and interpret symbols

III.2 Understand technical texts of general interest related to skills and professions

- Use the dictionary
- Define a word or a group of words according to the context
- Find the primary idea
- Find the secondary idea
- Know how to summarize orally and in writing

III.3 Evaluate technical texts of general interest related to skills and professions

- Check that the information is appropriate
- Distinguish an opinion from a fact
- Conclude after reading
- Make an oral appreciation of reading
- Know how to choose a text for a specific purpose

IV WRITING SKILLS

IV.1 Writing paragraphs

- Recognize the elements of a sentence
- Write simple sentences
- Build up vocabulary and spell it correctly
- Vary the structure of a sentence
- Punctuate sentences
- Understand and apply the rules of grammar
- Write a dictated text
- Know how to use the dictionary and the grammar
- Restore the plan of a paragraph
- Build the plan of a paragraph
- Write a paragraph from a plan
- Make a paragraph interesting

IV.2 Fill in many types of forms, especially those related to employment

- Recognize and know how to write abbreviations
- Understand data and follow the instructions
- Write legibly and properly
- Know how to give information in order
- Address envelopes

TERMINAL OBJECTIVES

COMMUNICATIONS - FRENCH

Intermediate Level

TERMINAL OBJECTIVES

I LISTENING SKILLS

- Present orally the summary of a verbal passage

II SPEAKING SKILLS

- Participate in a discussion while respecting the types of speech

III READING SKILLS

- Read in hushed voice a text of general interest
- Understand and interpret a text of general interest
- Evaluate texts of general interest according to their type

IV WRITING SKILLS

- Write a text respecting the techniques of writing
- Write a report
- Write texts in good `business French' (français des affaires) and fill forms

SUB-OBJECTIVES

I. LISTENING SKILLS

I.1 Find the subject and the important ideas of a verbal text

- Listen and concentrate on a text for a minimum of 10 minutes
- Find the title of a text
- Retain the main ideas

I.2 Starting with the important ideas, summarize the essentials of a verbal text

- Bring out the main ideas of the text
- Retain the main ideas of the text

II. SPEAKING SKILLS

II.1 Choose the ideas relevant to the subject discussed

- Think about the subject to be discussed
- Find the ideas that are directly related to the subject to be discussed

II.2 Express one's ideas concisely and in a complete sentence

- Identify the details that are essential to the idea
- Choose a precise vocabulary and use it in a sentence
- Formulate a question appropriately

II.3 Speak in a way to be well heard

- Speak loud enough to be well heard
- Speak with an appropriate rhythm
- Articulate well
- Speak with expression

II.4 Understand and apply the rules of discussion

- Organize one's ideas before speaking
- Confine oneself to the subject
- Wait for one's turn before speaking
- Listen to others' ideas
- Express oneself clearly
- Look at the person one is speaking to

III. READING SKILLS

III.1 Recognize and use scientific and mathematical symbols

- Read scientific and mathematical symbols
- Apply those symbols

III.2 Read complete sentences containing new words without hesitation

- Let the eyes read a few words before pronouncing them
- Pronounce new words correctly

III.3 Recognize and respect the rules of reading in hushed voice

- Read loud enough to be heard
- Respect the punctuation signs
- Pronounce words well
- Articulate well
- Read with expression appropriate to the passage

III.4 With the help of the dictionary, choose the suitable definition of a new word in a passage

- Find the best possible definition of a new word according to the meaning of the sentence
- Learn to use the dictionary

III.5 Reconstitute the plan of a text

- Learn how to develop a plan
- Find the primary and secondary ideas in the introduction, the development and the conclusion

III.6 Answer a questionnaire about data and comprehension of data in a text

- Recognize the different kinds of questions (factual or of comprehension)
- Answer orally and using complete sentences in one's own words
- Answer in writing and using complete sentences in one's own words

III.7 After reading a text, formulate questions

- Identify the essential ideas
- Formulate questions related to factual data
- Formulate questions related to comprehension

III.8 Know the characteristics of narration and description

- Define what narration and description are

III.9 Know the characteristics of report, statement and letter

- Define what a report, a statement and a letter are

III.10 Identify the characteristics and type of a given text

IV. WRITING SKILLS

IV.1 Find a rule of grammar in a book and apply this rule

- Know how to use a table of contents
- Know how to use an alphabetical index
- After finding a rule, apply it in given exercices

IV.2 Build sentences from the principal rules of grammar

- In a sentence, apply certain rules of grammar specific to the agreement of the verb with the subject
- In a sentence, apply certain rules of grammar specific to the agreement of the past participle
- Punctuate a given text using punctuation marks and typographical signs

IV.3 Write a complex sentence correctly

- Recognize the complex sentence
- Know the three different forms of complex sentences

IV.4 Build narative and descriptive sentences

- Know the principles and qualities of narration
- Know the principles and qualities of description
- In the building of narrative and descriptive sentences, use lively nouns, verbs of movement, picturesque verbs, enumerations and precise words

IV.5 Develop the plan of a narrative or descriptive paragraph

- Understand the subject well
- Write the primary and secondary ideas

IV.6 From a plan, write a narrative or a descriptive paragraph

- From a given plan, tell or describe

IV.7 In the writing of a paragraph, use stylistic devices of the direct and indirect speech and channels

- Use comparison, antithesis and progression
- Use direct and indirect speech
- Use affirmative, interrogative and exclamatory tones of voice

IV.8 From reference material, make out a synoptic chart

IV.9 Take notes on a given subject, indicate the references and build the bibliography

- Gather the information
- Build work sheets
- Learn to build a bibliography
- Learn to note references

IV.10 Organize one's documentaion and develop the plan of a report

IV.11 Recognize and write the transitions between paragraphs

- Know the different ways of marking transitions
- Understand the qualities of a correct transition

IV.12 Write a one page report

- From a plan, write the summary of a text, a film or an event

IV.13 Know and use the vocabulary of 'business French' (français des affaires)

- Know the precise meaning of certain words and expressions commonly used in the business language
- Familiarize oneself with the use of a word or an expression within a sentence
- Replace a given anglicism with the suitable French expression

IV.14 Distinguish between different types of business letters

- Know the characteristics of different types of business letters

IV.15 Understand the rules and parts of the business letter

IV.16 Write a job aplication letter and a second business letter as wished

- Understand the characteristics of the job application letter regarding its content and appearance

IV.17 Understand the rules and the plan of minutes

- Understand the qualities of minutes
- Know the parts of minutes

IV.18 Write minutes

- Develop the plan of minutes
- Write the rough copy
- Write the final text of minutes

IV.19 Fill different forms

- Properly fill a form (ex.: Social Insurance Number application, job application, passport application, opening an account in a banking institution, etc.)

TERMINAL OBJECTIVES

COMMUNICATIONS - FRENCH

ADVANCED LEVEL:

TERMINAL OBJECTIVES

I LISTENING SKILLS

- Present the report of an oral documentary

II. SPEAKING SKILLS

- Participate in a discussion and address a small group
- Prepare oneself and participate in an interview

III. READING SKILLS

- Interpret and evaluate texts of different natures

IV. WRITING SKILLS

- Understand and apply a methodology in preparation for writing a report and a research paper
- Write a resumé and its covering letter

SUB-OBJECTIVES

I. LISTENING SKILLS

I.1 Choose an appropriate oral documentary

I.2 Take notes from an oral documentary

- Shorten the ideas using key words, abbreviations and symbols

I.3 Organize one's information in preparation for the oral presentation of the report

- Develop a plan from the notes taken

II. SPEAKING SKILLS

II.1 Gather information on the proposed subject

- Know and consult sources of documentation
- Take notes
- Develop a plan

II.2 Familiarize oneself with the rules of discussion

II.3 Apply the rules of discussion

- Organize one's ideas before speaking
- Confine oneself to the subject
- Wait for one's turn before speaking
- Listen to others' ideas
- Express oneself clearly
- Look at the person one is speaking to

II.4 Understand the rules of an oral presentation

- Have a relaxed attitude
- Use gestures and movements
- Look at the audience
- Control the tone and the volume of one's voice

II.5 Improvise on a given subject for two minutes

- Confine oneself to the subject
- Follow a logical order
- Explain oneself clearly, briefly and in complete sentences
- Apply the rules of an oral presentation

II.6 Prepare a list of questions in preparation for an interview

- Gather information on the employer

II.7 Be prepared to give complete information

II.8 Apply the rules of the interview

- Be punctual for the appointment
- Be dressed appropriately
- Show an appropriate attitude and behaviour

III. READING SKILLS

III.1 Understand the rules of reading in a hushed voice

- Pronounce the words and the abbreviations correctly
- Link up words
- Recognize and respect the punctuation signs
- Establish a good reading rhythm
- Read expressively
- Read and interpret symbols

III.2 Read a text of many paragraphs fluently in front of a group

- Know how to read groups of words quickly

III.3 Pick up the message of the text

- Recognize the key words

III.4 Summarize the text

- Find the sections of the text
- Find the primary idea of each section
- Choose precise words
- Develop a plan of the summary

III.5 Conclude after a reading

- Recognize the value of a text according to the arguments presented
- Draw a personal conclusion

III.6 Appreciate the content and form of a text

- Distinguish between content and style

IV. WRITING SKILLS

IV.1 Know and use the library services

- Know the main services of a library
- Know the principles of the classification of books
- Familiarize onself with the main catalogues of a library
- Learn to read the index card of a book

IV.2 Take notes and organize them

- Establish the bibliography of the books to be consulted
- Explore the books and gather information
- Build the work files
- Arrange information

IV.3 Develop the table of contents, the bibliography and note the references

IV.4 Understand the rules of presentation for a research project assignment

- Understand the qualities of a good presentation
- Familiarize oneself with the material in preparation for a research assignment

IV.5 Develop the plan and write a two or three page report

- Understand the qualities of a good report

IV.6 Develop the plan and write a research assignment of five pages or more

- Understand the qualities of a good research assignment
- Know the parts of a research assignment
- Formulate one's ideas according to the work cards
- Know how to choose a relevant quote
- Familiarize oneself with the proper style of work involved in research

IV.7 Know the qualities of a resume

IV.8 Develop the plan and write one's resume

IV.9 Know the parts of the covering letter

IV.10 Write a covering letter

APPENDIX 13

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